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Contents

	Page
Contributions to the knowledge of dictynid spider fauna of Turkey (Araneae, Dictynidae) Tarık Danişman, Gökhan Gündüz, Abdullah Bayram, İlhan Coşar & Hüseyin Allahverdi	63
First record of the linyphiid spider <i>Walckenaeria furcillata</i> (Menge, 1869) (Araneae, Linyphiidae) in Turkey Tarık Danişman	68
A poorly known species of the spider genus <i>Araeoncus</i> Simon, 1884 (Araneae, Linyphiidae) in Turkey Tarık Danişman & İlhan Coşar	71
Inventory and distribution of scorpion fauna in eastern Morocco (Arachnida, Scorpiones) Oulaid Touloun, Moulay Abdelmonaim Elhidan & Ali Boumezzough	73
A new salticid spider record from Turkey (Araneae, Salticidae) İlhan Coşar & Tarık Danişman	80
The jumping spiders' fauna of Kırıkkale Province (Araneae, Salticidae) İlhan Coşar, Tarık Danişman & Fatma Azize Budak Yıldırım	83
The first record of genus <i>Acartauchenius</i> Simon, 1884 (Araneae, Linyphiidae) in Turkey Zafer Sancak & Melek Erdek	95
The first record of <i>Levymanus gershomi</i> in Saudi Arabia (Araneae, Palpimanidae) Hisham K. El-Hennawy	97
Two new records of genus <i>Zodariion</i> from Turkey (Araneae, Zodariidae) Adile Akpınar & M. İsmail Varol	102
New data and records of spiders from North-Eastern Iran (Arachnida: Araneae) Hussein Sadeghi Namaghi, Mahnaz Kaykhosravi & Alireza Zamani	105

Volume 14 (2014-2015)

Back issues: Vol. 1 (1987-1990), Vol. 2 (1990-1992), Vol. 3 (1992-1993), Vol. 4 (1994-1996), Vol. 5 (1996-1997), Vol. 6 (1998-2000), Vol. 7 (2000-2001), Vol. 8 (2002-2003), Vol. 9 (2004-2005), Vol. 10 (2006-2007), Vol. 11 (2008-2009), Vol. 12 (2010-2011), Vol. 13 (2012-2013).

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Contributions to the knowledge of dictynid spider fauna of Turkey (Araneae, Dictynidae)

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Abstract

Three dictynid spider species, *Altella lucida* (Simon, 1874), *Brommella falcigera* (Balogh, 1935), and *Lathys lehtineni* Kovblyuk, Kastrygina & Omelko, 2014 are reported for the first time from Turkey. Their morphology is briefly described and illustrated.

Keywords: Spiders, Araneae, Dictynidae, *Altella lucida*, *Brommella falcigera*, *Lathys lehtineni*, Turkey.

Introduction

Dictynidae is currently represented by 578 species belonging to 51 genera in the world (Platnick, 2014). A total of 16 species in 8 genera of Dictynidae are known in Turkey (Bayram *et al.*, 2014). With this paper, we add two genera and one species to the spider fauna of Turkey. These taxa are *Altella lucida* (Simon, 1874), *Brommella falcigera* (Balogh, 1935), and *Lathys lehtineni* Kovblyuk, Kastrygina & Omelko, 2014.

Material and Methods

This study is based on the material collected in 2011 and 2012 from different regions of Turkey. The specimens were taken through leaf litter by means of hand aspirator and sifter. Specimens were preserved in 70% ethanol. Chiefly well known identification keys were used for identification (Heimer & Nentwig, 1991; Roberts, 1995; Almquist, 2006; Kovblyuk *et al.*, 2014). The specimens were deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM) and Central Laboratory of Muş Alparslan University. Pictures were taken using a Leica S8APO microscope by means of a Leica DC 160 camera when specimens were in deep cups with a wax bottom.

SEM microphotographs were made with JEOL JSM-5600 in the University of Kırkkale. All measurements are given in millimetres.

Abbreviations used: Fe = femur, L = length, Mt = metatarsus, Pa = patella, Ta = tarsus, Ti = tibia, W = width.

Results

Altella Simon, 1884

Small spiders, generally <2 mm. Whole body is yellowish and covered with hairs. Legs with strong, large or small spines. Cribellum is not divided.

Altella lucida (Simon, 1874)

Material. 1♀, Muş Province, Hasköy District, Dağdibi village (38°68'48"N, 41°65'70"E), 09-10-2012.

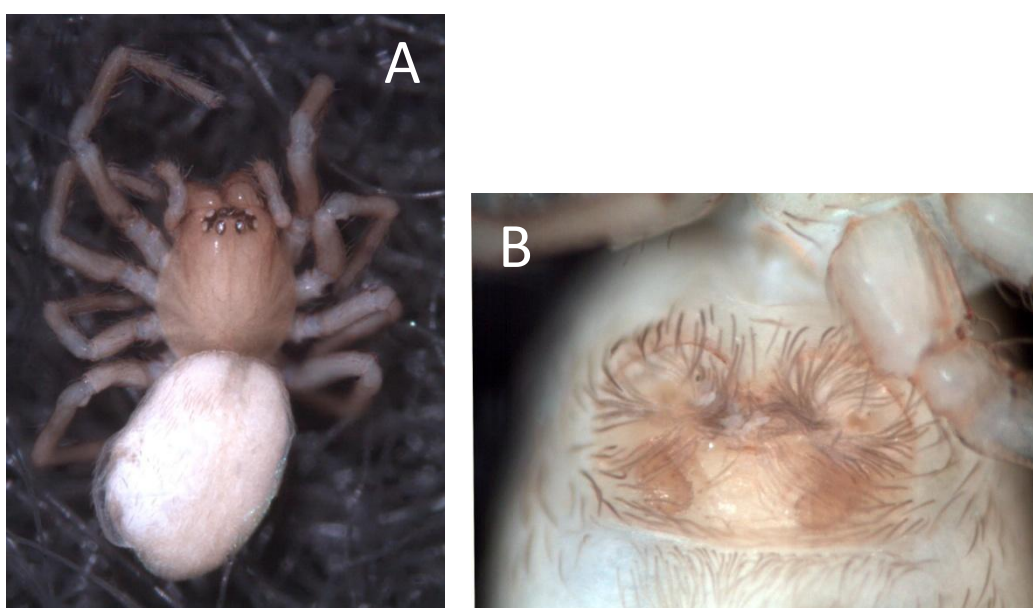


Fig. 1. *Altella lucida* ♀. A. habitus, dorsal view. B. Epigynum, ventral view.

Description:

Female (Fig. 1A). Total length 1.56; Prosoma L 0.66, W 0.51; Opisthosoma L 0.9, W 0.53. Carapace light yellowish. Eyes encircled with black area. Anterior eye row slightly recurved. Posterior eye row nearly straight. Legs formula 1423 (Table 1). Tibia I has a ventrolateral spine. Female has two oval shaped copulatory openings which are covered by dense hairs (Fig. 1B). Epigynal plate L 0.25, W 0.37.

Distribution: Europe (Platnick, 2014).

Table 1. Measurements of the legs of *Altella lucida* (Simon, 1874) female.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	0.35	0.20	0.41	0.21	0.21	1.38
II	0.31	0.15	0.23	0.18	0.20	1.07
III	0.31	0.15	0.18	0.17	0.16	0.97
IV	0.40	0.21	0.27	0.31	0.17	1.36

***Brommella* Tullgren, 1948**

Ocular area black. Anterior and posterior eye rows slightly procurved. Anterior median eyes smaller than anterior laterals. Tibial apophysis of the male palp as long as the cymbium.

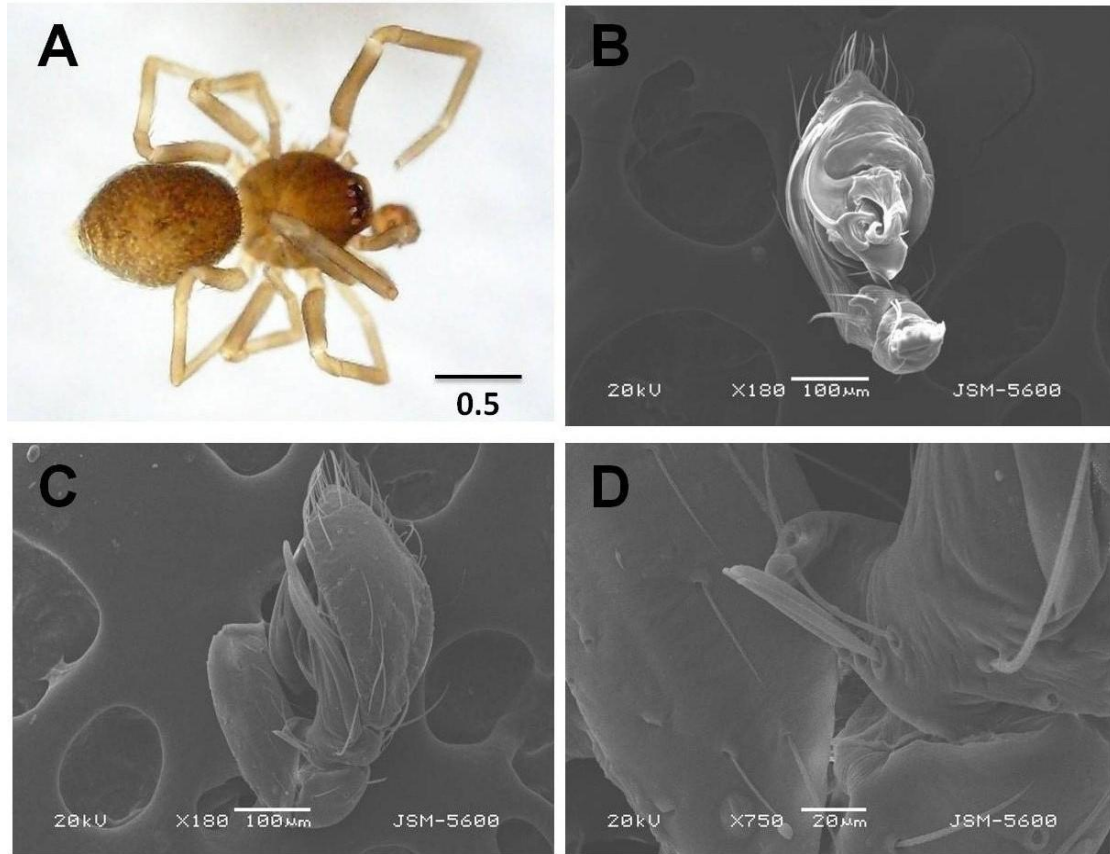


Fig. 2. *Brommella falcigera* ♂. A. Habitus, dorsal view. B. Palp ventral view. C. Palp retrolateral view. D. Palpal tibial apophysis.

***Brommella falcigera* (Balogh, 1935)**

Material. 1♂, Çankırı Province, Ilgaz District (40°52'30"N, 33°39'19"E), 09-09-2011.

Description:

Male (Fig. 2A). Total length 1.55; Prosoma L 0.70, W 0.60; Opisthosoma L 0.85, W 0.65. Carapace light yellowish brown. Ocular area black. Legs formula 1432 (Table 2). Tibia of the male palp with 2 apophyses; one curved, extremely large as long as cymbium. Small prolateral apophysis pointed and with dense brush. Embolus long and thread-like. Conductor carries a hook on its tip (Fig. 2B-D).

Distribution: Europe (Platnick, 2014).

Table 2. Measurements of the legs of *Brommella falcigera* (Balogh, 1935) male.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	0.55	0.12	0.45	0.42	0.27	1.81
II	0.47	0.12	0.25	0.28	0.22	1.34
III	0.47	0.12	0.25	0.30	0.22	1.36
IV	0.52	0.12	0.37	0.42	0.27	1.70

Lathys Simon, 1884

Anterior median eyes smaller than anterior laterals and posteriors. Anterior eye row slightly recurved. Posterior eye row procurved. Conductor spur extends over tibia.

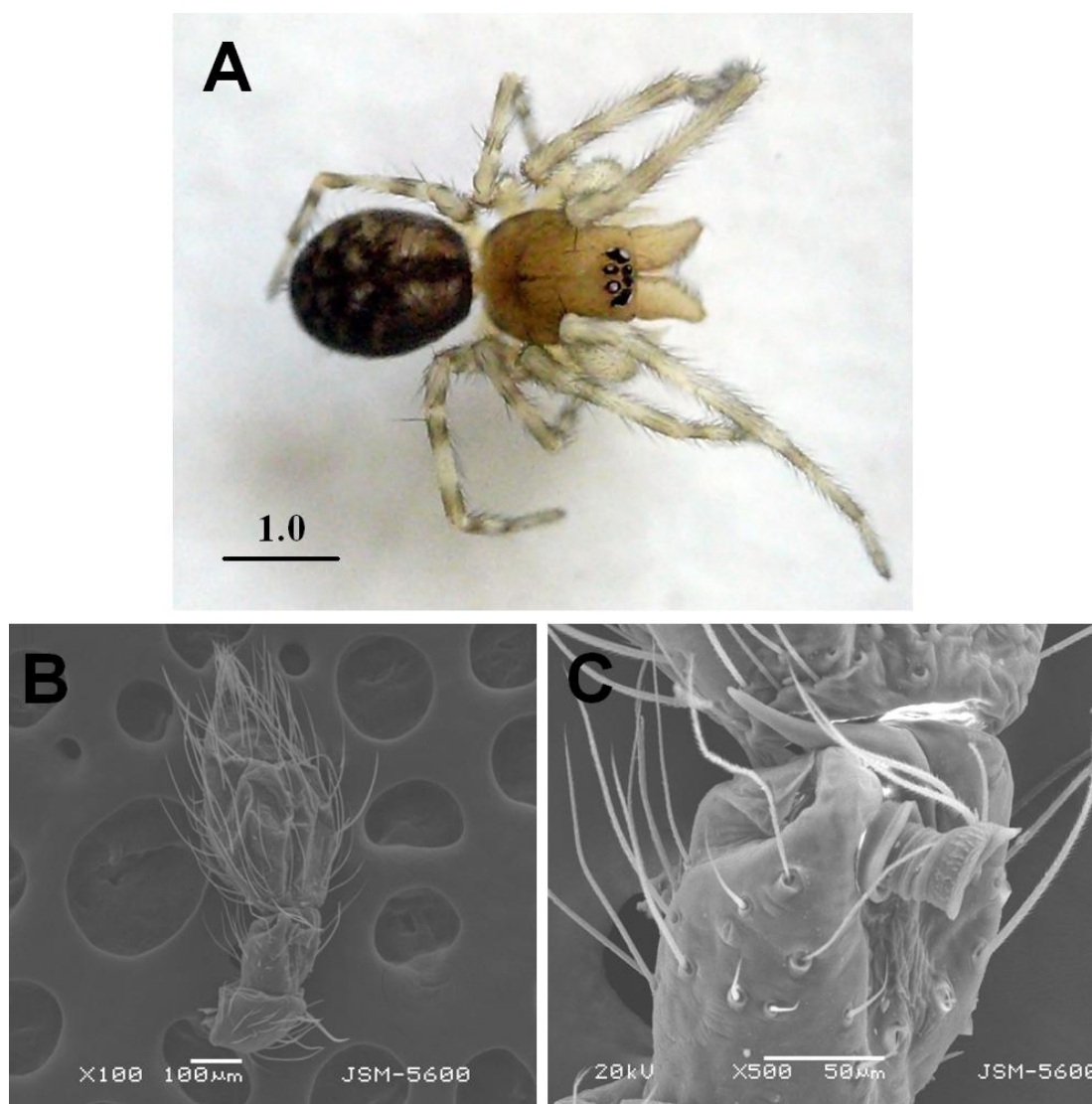


Fig. 3. *Lathys lehtineni* ♂. A. Habitus, dorsal view. B. Palp, dorsal view. C. Palpal tibial apophysis.

Lathys lehtineni Kovblyuk, Kastygina & Omelko, 2014

Material. 1♂, Aydın Province, Karpuzlu District (37°33'32"N, 27°48'48"E), 27-01-2012.

Description:

Male (Fig. 3A). Total length 2.55; Prosoma L 1.20, W 1.0; Opisthosoma L 1.35, W 1.10. Prosoma yellowish brown. Opisthosoma dark brown. Legs formula 1423 (Table 3). Conductor with two long protrusions. The upper protrusion appears like a triangular tongue in ventral view, and the lower one with corkscrew-like protrusion. The tip of terminal part of conductor with 3 coiled part. Palpal patella with dorsal conical extension (Fig. 3B-C).

Distribution: Ukraine (Crimea) (Kovblyuk *et al.*, 2014; Platnick, 2014).

Table 3. Measurements of the legs of *Lathys lehtineni* Kovblyuk, Kastrygina & Omelko, 2014 male.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	1.50	0.40	1.15	0.80	0.60	4.45
II	1.50	0.35	1.00	0.75	0.50	4.10
III	0.90	0.30	0.75	0.65	0.40	3.00
IV	1.50	0.40	1.00	0.80	0.50	4.20

Discussion

The morphometric measurements and other characteristic features of these species are not different from European specimens. With this study, the number of dictynid spiders in Turkey has increased from 16 species belonging to 8 genera to 19 species belonging to 10 genera. As a result of our study, two new genera (*Altella* and *Brommella*) and three new species records were given for the araneofauna of Turkey. Therefore, we expect that more new Turkish records of Dictynidae will be found in the future.

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First record of the linyphiid spider *Walckenaeria furcillata* (Menge, 1869) (Araneae, Linyphiidae) in Turkey

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Abstract

This short paper reports the linyphiid species *Walckenaeria furcillata* (Menge, 1869) as new for the Turkish spider fauna. Its characteristic features and photographs are presented. The total number of linyphiid species recorded from Turkey is now 117.

Keywords: Spiders, Araneae, Linyphiidae, Taxonomy, new record, Turkey.

Introduction

A total of 4490 species in 591 genera have been identified in the family Linyphiidae all over the world (Platnick, 2014).

Genus *Walckenaeria* Blackwall, 1833 is well studied in the Palaearctic, Neotropic, Nearctic, Ethiopic, and Oriental regions and hitherto 5 species have been known from Turkey (Bayram *et al.*, 2014). These species are *W. abantensis* Wunderlich, 1995, *W. aksoyi* Seyyar, Demir & Türkeş, 2008, *W. alticeps* (Denis, 1952), *W. antica* (Wider, 1834) and *W. atrotibialis* (O.P.-Cambridge, 1878). This short paper deals with the characteristic features and distribution of *Walckenaeria furcillata* (Menge, 1869) adding a new species to the spider fauna of Turkey.

Material and Methods

One male and one female specimens were examined in this study. Specimens were collected during the day by hand aspirator from under stones and are deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM). Pictures were taken using a Leica S8APO microscope by means of a Leica DC 160 camera, in dishes of different sizes with paraffin on the bottom. Different size holes were made in the paraffin to keep specimens in the right position. The specimens were preserved in 70% ethanol. All measurements and scales are in millimetres.

Results

Walckenaeria furcillata (Menge, 1869) (Figs. 1-2)

Material examined: 1♂, 1♀, Sinop Province, Ayancık district, (41°57'07"N, 34°47'54"E), 08.06.2013, from a garden, (KUAM-LIN. Wal. furc.01-02).

Description of male:

Body length: 2.5 mm. Prosoma light brown with darker ocular area. Abdomen greyish black, slightly elongate. Legs orange brown, not stained and tibia I not darkened. Tibial chaetotaxy 2.2.1.1. Prosoma with slender, narrow and bifurcated long horn. Male palpal tibia with 2 protrudings, palpal organ characteristic (Fig. 1).

Description of female:

Body length: 2.7 mm. Similar to male except: Prosoma light brown, without horn. Epigynal median plate anteriorly distinctly marked off as circular oval plate (Fig. 2).

Distribution: Palearctic (Platnick, 2014).

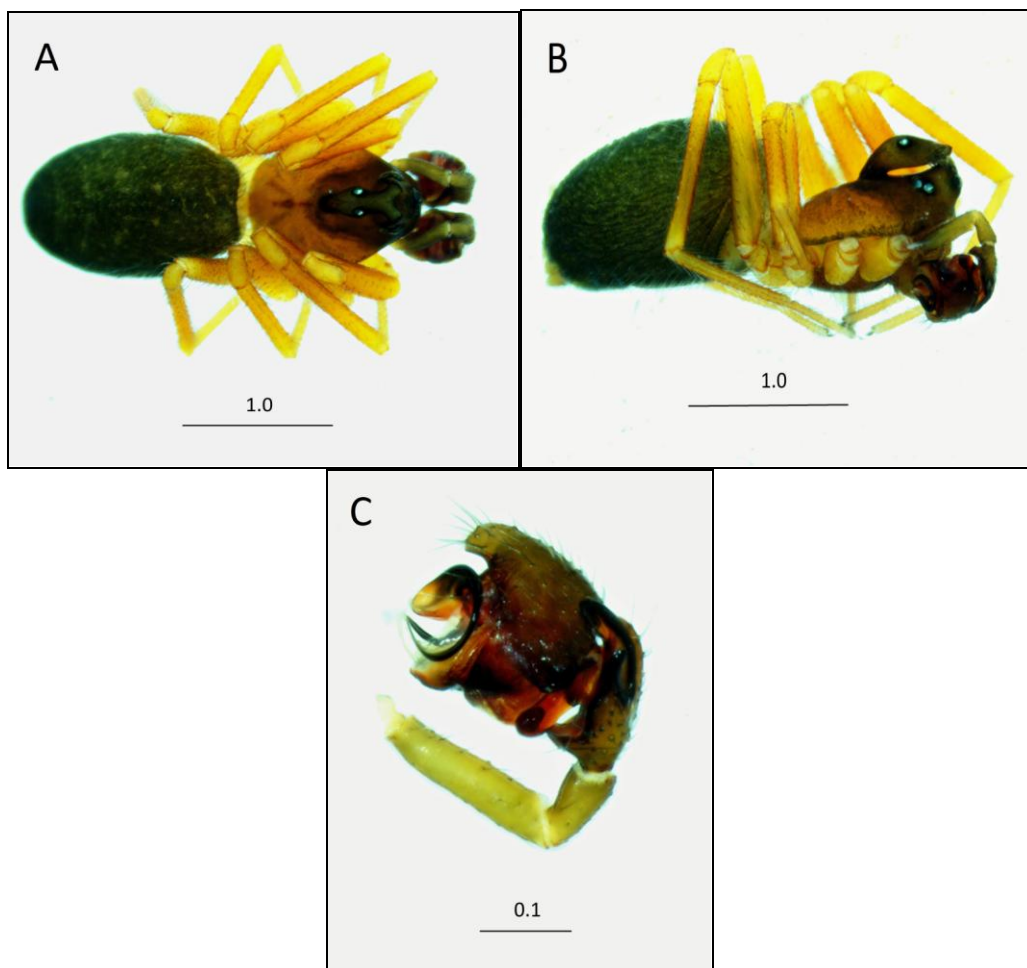


Fig. 1. *Walckenaeria furcillata* ♂. A. Habitus, dorsal view. B. Habitus, lateral view. C. Pedipalp, retrolateral view.

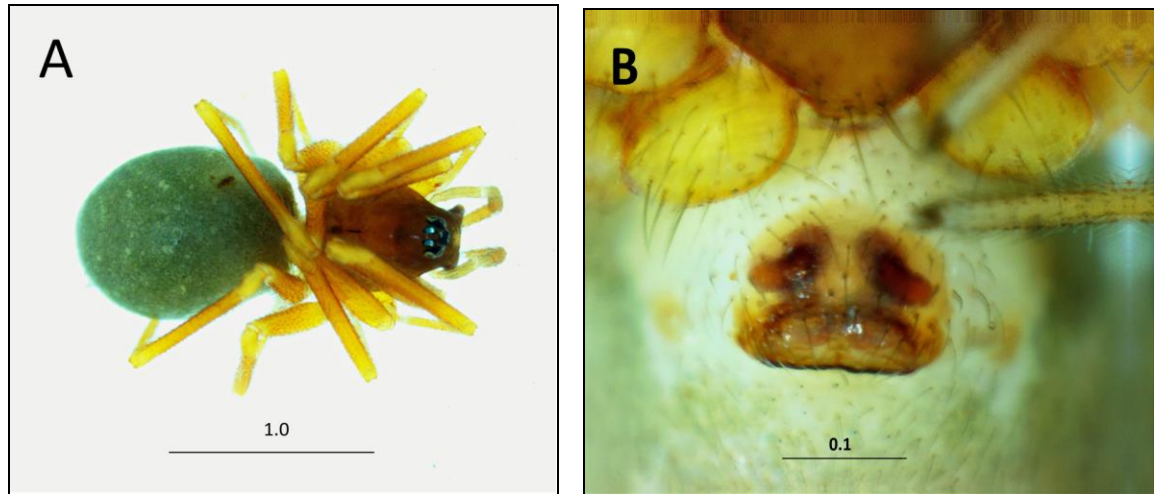


Fig. 2. *Walckenaeria furcillata* ♀. A. Habitus, dorsal view. B. Epigyne, ventral view.

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A poorly known species of the spider genus *Araeoncus* Simon, 1884 (Araneae, Linyphiidae) in Turkey

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Abstract

A little known linyphiid spider species, *Araeoncus tauricus* Gnelitsa, 2005 is recorded for the first time from Turkey. Its morphology is briefly described and illustrated.

Keywords: Spiders, Araneae, Linyphiidae, *Araeoncus tauricus*, new record, Turkey.

Introduction

Genus *Araeoncus* Simon 1884 is well studied in the Afro-Palaearctic regions of the world. Three species have hitherto been known in Turkey from *Araeoncus*. (Bayram *et al.*, 2014). These species are *A. clavatus* Tanasevitch, 1987, *A. humilis* (Blackwall, 1841) and *A. mitriformis* Tanasevitch, 2008. This short paper deals with the characteristic features and distribution of *Araeoncus tauricus* Gnelitsa, 2005 and adds a new species to the spider fauna of Turkey.

Material and Methods

One male specimen was examined in this study. This specimen was collected during the day by hand aspirator from under stones and is deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM). Pictures were taken using a Leica S8APO microscope by means of a Leica DC 160 camera, in a dish with paraffin on the bottom. Different size holes were made in the paraffin to keep specimen in the right position. The specimen was preserved in 70% ethanol. All measurements are in millimetres.

Results

Araeoncus tauricus Gnelitsa, 2005 (Figs. 1-2)

A. t. Deltshv, Lazarov & Blagoev, 2004 (♂♀, nomen nudum).

A. t. Gnelitsa, 2005 (D♂♀).

Material examined: 1♂, Kayseri Province, Erciyes Mountain, (38°35'11"N, 35°30'18"E), 21.05.2012, from a garden, (KUAM-LIN. Ara. taur.01).

Description of male:

Body length 3.2 mm. Prosoma yellowish brown. Abdomen greyish black, slightly elongate. Legs yellow, not stained. Tibial chaetotaxy 2.2.1.1. Prosoma with cephalic lobe elongated upwards. Male palpal tibia considerably larger, with 2 protrudings, like spoon. Pedipalp with projection on the radix at the embolic base (Figs. 1-2).

Distribution: Bulgaria, Ukraine, Crete (Platnick, 2014).



Figs. 1-2. *Araeoncus tauricus* ♂. 1. habitus, lateral view. 2. pedipalp, retrolateral view.

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Inventory and distribution of scorpion fauna in eastern Morocco (Arachnida, Scorpiones)

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Abstract

Little is known about the distribution of scorpions in eastern Morocco. Our investigations in this area showed the presence of eight species belonging to two families: Buthidae (*Androctonus liouvillei*, *A. mauritanicus*, *Buthus albengai*, *B. confluens*, *B. paris*) and Scorpionidae (*Scorpio fuliginosus*, *S. hesperus*, *S. punicus*). The geographical distribution of some collected species is discussed.

Keywords: Scorpions, *Androctonus*, *Buthus*, *Scorpio*, inventory, distribution, Eastern Morocco.

Introduction

The publication of Vachon (1952) remains so far the only synthetic work on the systematics and distribution of North African scorpions. Despite the importance of this work, a high biodiversity of North African scorpions continues to be unveiled (Lourenço, 2003, 2005; Touloun & Boumezzough, 2011). The complexity of this scorpion population was noted, especially among the most common and the most polymorphic genera in Morocco: *Buthus* Leach, 1915, *Androctonus* Ehrenberg, 1828 and *Scorpio* Linnaeus, 1758 (Vachon, 1952). Recently, taxonomic revisions of these three genera were carried out in northern Africa (Lourenço, 2003, 2005, 2009) but not in eastern Morocco where scorpion fauna remained unknown.

In the aim to describe the species composition of scorpion fauna in eastern Morocco, our investigations were conducted in June 2013. Eight stations of study area were prospected with altitude ranging from 240 to 1526m.

Material and Methods

Study area

Eastern Morocco is one prefecture (Oujda) and six provinces (Driouch, Nador, Berkane, Taourirt, Jerada and Figuig) (Fig. 1). It covers an area of 82,820 km² (11.6% of the total land area).

It is bounded on the north by the Mediterranean Sea, in east and south by the Moroccan-Algerian border and on the west by the provinces of Al Hoceima, Taza, Boulmane and Errachidia.

Two kinds of climate prevail in the region, a Mediterranean climate in the north, influenced by the mountains especially in their southern slopes and a continental climate in the south sensitive to Saharan factors. With the exception of mountain and irrigated areas in the north, the vegetation is almost nonexistent in the southern region if we exclude Alfa steppe highlands.

Scorpion collecting and identification

To locate scorpions, the ground was examined by lifting rocks, stones and tree bark. The burrows considered to be occupied by scorpions were destroyed with a shovel to try to dislodge them. For the anthropophilic species, we investigated under stones and near indoor dwellings. The property that renders the scorpion carapace strongly fluorescent under ultraviolet light creates an excellent opportunity to detect these nocturnal arachnids. So, the nocturnal missions were conducted, using portable ultraviolet lamps. Table (1) summarizes the characteristics and coordinates of each station. Specimens were identified in laboratory using the keys and descriptions published by Vachon (1952), Lourenço (2003, 2005, 2009), and Lourenço *et al.* (2012).

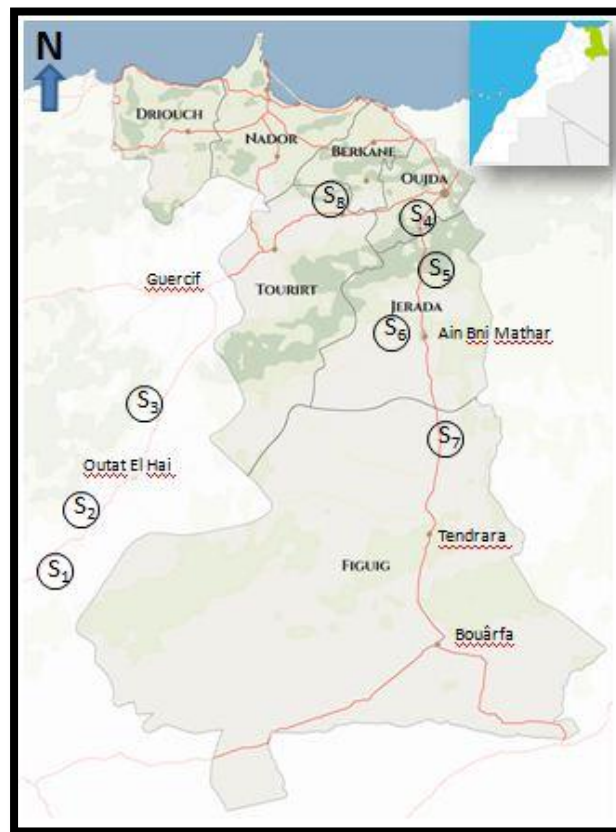


Fig. 1. Map showing the locations of the eight study sites.

Table 1. Characteristics and coordinates of prospected sites.

Code	Station	Altitude (m)	Points GPS	Vegetation	Substrate
S ₁	80 km south of Missour	1526	32,673840N 004,61551W	Sparse steppe to <i>Peganum harmala</i>	stony
S ₂	4 km north of Missour	915	33,11564N 003,94788W	herbaceous	stony
S ₃	86 km to Guercif	716	33,66869N 003,53819W	Steppe of jujube	stony
S ₄	2 km south of Oujda	712	33,66868N 003,53829W	Steppe of jujube	rocky
S ₅	33 km north of Ain Beni Mathar	1097	34,31430N 002,054453W	Steppe of alfa and pistachio	rocky-stony
S ₆	20 km north of Ain Beni Mathar	951	33,07402N 002,02669W	reforestation of Aleppo pine	rocky
S ₇	80 km north of Tandrara	999	33,89272N 002,01930W	without vegetation	rocky sandy
S ₈	9 km north of Tafoughalt	240	33,89279N 002,01924W	Forest of red juniper	locally rocky

Results and Discussion

Scorpion fauna: Our investigations showed the presence of eight scorpion species in eastern Morocco, belonging to two families:

Family Buthidae C.L. Koch, 1837

Subfamily **Buthinae** Kraepelin, 1899

Androctonus liouvillei (Pallary, 1924)

A. mauritanicus (Pocock, 1902)

Buthus albengai Lourenço, 2003

B. confluens Lourenço, Touloun & Boumezzough, 2012

B. paris (C.L. Koch, 1839)

Family Scorpionidae Latreille, 1802

Subfamily **Scorpioninae** Pocock, 1893

Scorpio fuliginosus (Pallary, 1928)

S. hesperus Birula, 1910

S. punicus Fet, 2000

Genus *Androctonus* Ehrenberg, 1828 (Fig. 2)

This genus includes the most fearsome species across North Africa (*Androctonus mauritanicus* and *A. australis*). It is regarded as a typical representative of the native fauna that inhabited North Africa (Vachon, 1952). Two species have been recorded:

Androctonus liouvillei (Pocock, 1902)

This endemic species occupies a large part of southern Morocco in the Anti Atlas (Jbel Bani), and the two valleys of the Oued Draa and Tafilalet (Vachon, 1952; Touloun, 2004). In the south of the High Atlas, it also occupies Tata and Akka areas up to 170 km

north of Tarfaya on the Atlantic coast this latter locality is so far the southern limit of the species.

In this mission we discovered it in the S₆ and S₇ stations where it lives under rocks on a sandy substrate without digging burrows (Fig. 3).

Androctonus mauritanicus (Pocock, 1902)

This scorpion has a wide distribution in Morocco, where it is endemic and reputedly the most dangerous (Touloun *et al.*, 2001). It is anthropophilic and has a marked predilection for areas modified by human activities and their neighbourhood. However during this mission, it was collected only in S₈ (Fig. 3).

It is important to note that other species of the same genus, *A. australis*, responsible for several fatal accidents each year in Algeria and Tunisia has recently been reported in Morocco and more precisely in the study area. It was discovered 24 km after Bouâarfa towards Tendirra along the P.19 road, about 1350 m of altitude [latitude / longitude (WGS84): 32.677°N / 2.054°W] (Geniez, 2009). This new station is considered the first in Morocco and also as the most western of the species distribution.



Fig. 2. Illustrations of scorpions of the study area (Photos: O. Touloun, June 2013).
A. *Androctonus liouvillei*. B. *A. mauritanicus*. C. *Buthus albengai*. D. *B. confluens*. E. *B. paris*. F. *Scorpio fuliginosus*. G. *S. hesperus*. H. *S. punicus*.

Genus ***Buthus*** Leach, 1815 (Fig. 2)

The distribution of genus *Buthus* remains extensive. It is found in Africa, Asia and Europe (Fet & Lowe, 2000; Lourenço, 2003).

In Morocco, in the past decade, several new species have been well described and several old varieties and / or subspecies have been restored to the rank of subspecies or even species (Lourenço, 2003; Lourenço & Vachon, 2004; Touloun & Boumezzough, 2011 Lourenço *et al.*, 2012). Three species of the genus were inventoried in the study area, which two are endemic to Morocco.

Buthus albengai Lourenço, 2003

This endemic species of Morocco was described for the first time in the Middle Atlas (Ifrane and Khenifra) (Lourenço, 2003). It was collected in S₁, S₂ and S₃ (Fig. 3). These three new stations expand to the north the distribution area of the species so far known.

Buthus confluens (Lourenço, Touloun & Boumezzough, 2011)

This Moroccan endemic was described for the first time in 2011 from south of Tetouan. View the position of the station discovery of this species in northern Morocco,

its diagnosis has shown that it has not systematic affinity with *Buthus ibericus* from southern Spain (Lourenço *et al.*, 2012).

Here, this species was collected in forest area of S₈ (Fig. 3). This locality is considered as the most eastern distribution area of the species.

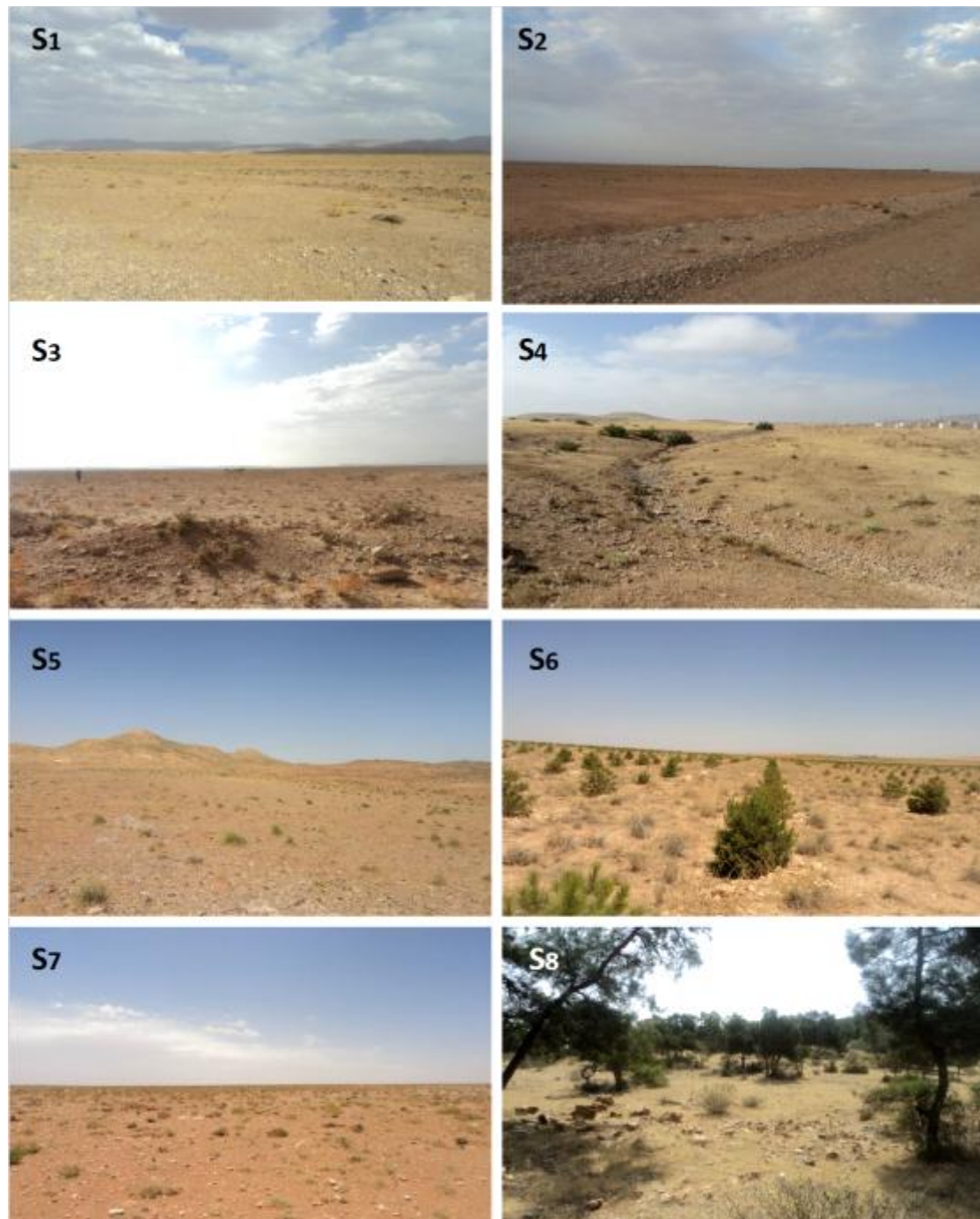


Fig. 3. Illustration of the eight study sites (Photo: O. Touloun, June 2013).

***Buthus paris* (C.L. Koch, 1839)**

This species has been described after examining the specimens collected in Ain Almou Oujda, Tangier, Taza and in middle Atlas (Azrou, Ain Louh Oulmès, Khenifra Elharcha, Tadla, Ait Atab and Demnate) (Vachon, 1952). It corresponded to *Buthus occitanus paris* before regaining at the species rank (Lourenço, 2003). It also occupies

massive coasts of Tunisia and eastern Algeria to the west Algiers meridian (Arroyo, 1963). We also discovered it at the northern borders of the Central and Western High Atlas and below 1300 m and in the Middle Atlas in the Azilal province: Tagleft (900 m) and Taghra (1200 m) regions (Touloun, 2004).

In this mission, we have discovered it in the stations S₄, S₅, S₆ and S₇ living under rocks or in covered burrows with shallow depth (Fig. 3).

Genus *Scorpio* Linnaeus, 1758 (Fig. 2)

Vachon (1952) had already reported the complexity of this monospecific genus. This led to a revision of this genus in which several subspecies have been elevated to the species rank (Lourenço, 2009). The species of this genus are strictly ground-dwelling and live in deep whose depth varies according to the type of substrate. Three species, which two are endemic to Morocco, were surveyed in the study area:

Scorpio fuliginosus (Pallary, 1928)

This endemic species of Morocco is known from pre-forest and forest areas of the High Atlas from 900 m of altitude (Vachon, 1952; Touloun, 2004). This is the first time that this species was discovered on a high plateau with very little vegetation cover (station S₃).

Scorpio hesperus Birula, 1910

This is also endemic in northern Morocco (Vachon, 195). We collected it for the first time in this region in S₆ and S₇ stations.

Scorpio punicus Fet, 2000

This known species in Tunisia and Algeria corresponded to *Scorpio maurus tunetanus* Birula, 1910 before the recent revision of the genus (Vachon, 1952). It is found in Station S₈ in a forest.

Conclusion

The specific richness of scorpion fauna in our study area will be explained by the diversity of habitats in eastern Morocco. However, it should be noted that this inventory is not exhaustive and other investigations are necessary to complete this inventory and update the distribution of this scorpion fauna.

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A new salticid spider record from Turkey (Araneae, Salticidae)

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Abstract

The salticid spider species *Pellenes moreanus* Metzner, 1999 is recorded for the first time from Turkey. Its morphology is briefly described and illustrated.

Keywords: Spiders, Araneae, Salticidae, *Pellenes moreanus*, new record, Turkey.

Introduction

Family Salticidae is represented by 600 genera and 5755 species in the world (Platnick, 2014). Within Turkish spider fauna, with a total of 330 genera and 1013 species, it is represented by 106 species of 40 genera (Bayram *et al.*, 2014). In this paper, we add one jumping spider species to the spider fauna of Turkey. This species is *Pellenes moreanus* Metzner, 1999.

Material and Methods

This study is based on a specimen collected in 2012 from Kırıkkale province of Turkey by means of hand aspirator from stony ground and preserved in 70% ethanol. The identification was made with Leica S8APO stereomicroscope depending on Metzner (1999). The specimen was photographed and SEM photographs of male palps were taken by Jeol JSM 5600 Scanning Electron Microscope.

Abbreviations used are as follows: Fe = femur, L = length, Mt = metatarsus, Pa = patella, Ta = tarsus, Ti = tibia, TL = total length, W = width.

All measurements are given in millimetres. The specimen is deposited in the collection of the Arachnological Museum of Kırıkkale University (KUAM).

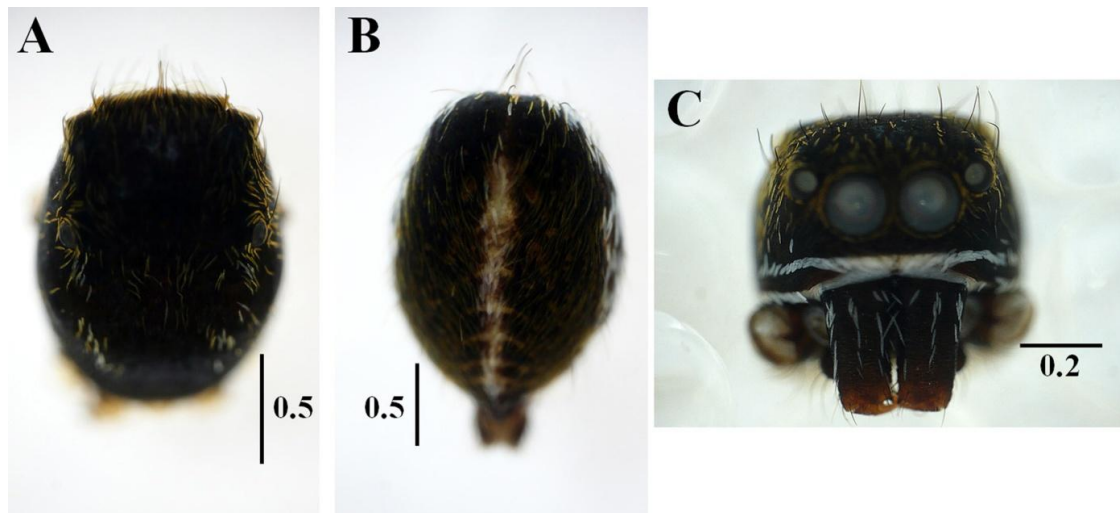


Fig. 1. *Pellenes moreanus* ♂. A. Prosoma, dorsal view. B. Opisthosoma, dorsal view. C. Ocular area, frontal view.

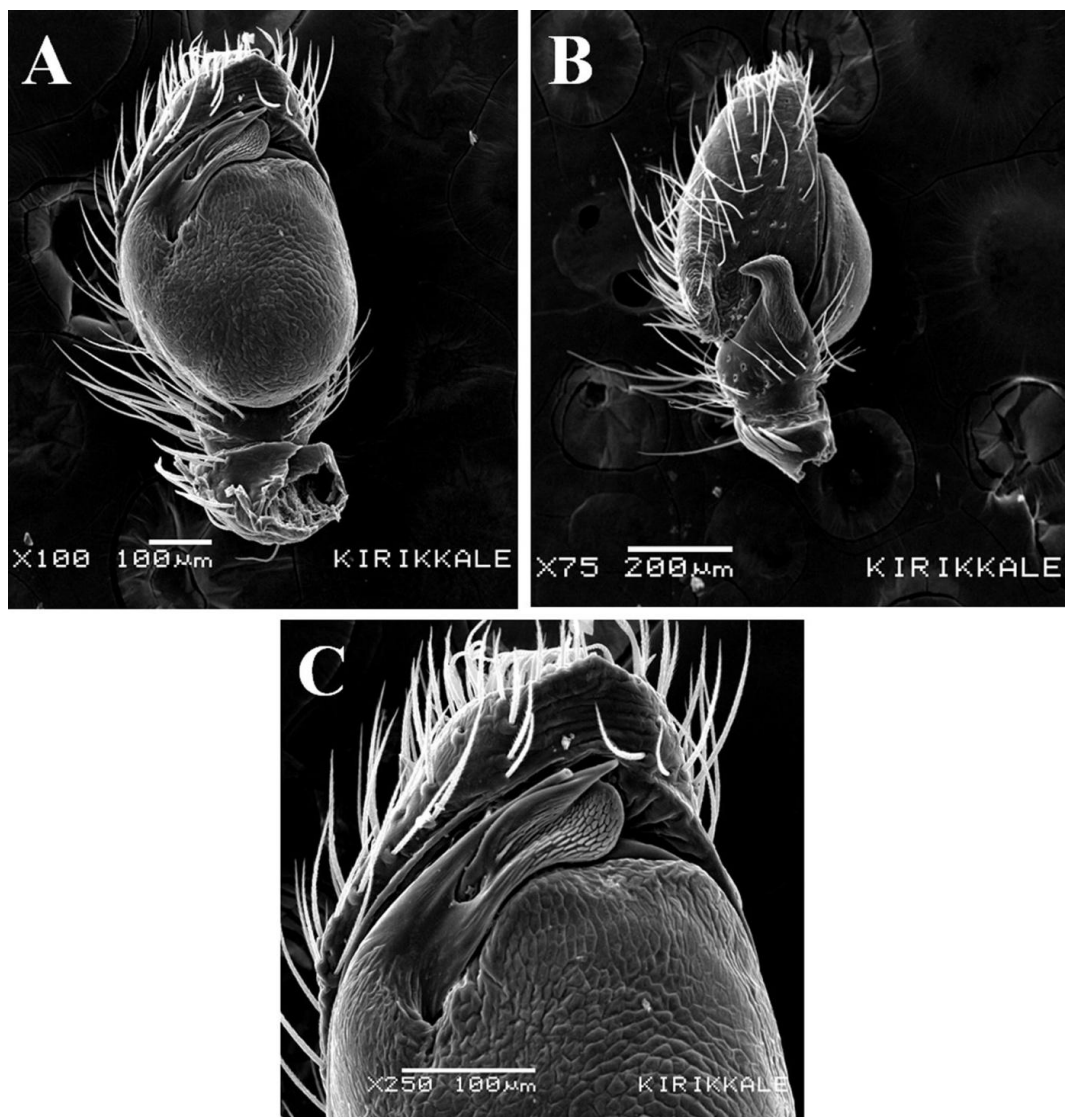


Fig. 2. *Pellenes moreanus*, male pedipalp. A. ventral view. B. retrolateral view. C. Embolus.

Results

Pellenes moreanus Metzner, 1999

Material examined: 1♂, Kırıkkale Province, Keskin District (39°44'N, 33°31'E), 05.06.2012, from stony ground. Leg. İ. Coşar.

Male description: Prosoma has black-yellow hairs with laterally located line-shaped white hairs. The surrounding of frontal eyes is covered with yellow hairs. Clypeus is dark and thin. Chelicerae are brown with white hairs dorsally. Opisthosoma is black and intensely covered with yellow hairs. Line-shaped white hairs are present along the middle of opisthosoma. Legs are dark brown and hairy. Retrolateral tibial apophysis of pedipalp is large, with blunt and slant tip, and merely resembles eagle's head. Embolus is slightly long and extends towards upper medial part of bulb.

Measurements: TL 3.30; prosoma L 1.55, W 1.15, opisthosoma L 1.75, W 1.0.

Legs measurements: Table (1). Leg formula: I-III-IV-II.

Table 1. Measurements of the legs of male *Pellenes moreanus* Metzner, 1999.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	1.04	0.52	0.76	0.48	0.40	3.20
II	0.62	0.37	0.47	0.27	0.30	2.03
III	1.15	0.55	0.60	0.45	0.40	3.15
IV	0.80	0.35	0.45	0.40	0.40	2.40

Distribution: Greece (Platnick, 2014).

Comment: New record for spider fauna of Turkey.

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The jumping spiders' fauna of Kırıkkale Province (Araneae, Salticidae)

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Abstract

In this study, jumping spider fauna of Kırıkkale was investigated and 37 species belonging to 21 genera were identified. Examined samples were collected from various localities in the region between April 2011 and August 2012. Total of 231 specimens have been collected as a result of the field studies. As a result, 4 species: *Leptorchestes sikorskii* Prószyński, 2000, *Neaetha absheronica* Logunov & Guseinov, 2002, *Plexippus clemens* (O.P.-Cambridge, 1872), and *Synageles albotrimaculatus* (Lucas, 1846) are new records for Turkey spider fauna. Systematic and faunistic data of these species as well as ecological survey notes were recorded.

Keywords: Spiders, Araneae, Salticidae, new records, Turkey.

Introduction

Spiders (Order Araneae), under Class Arachnida, form the largest group of this class with 114 families, 3935 genera and 44906 species in the world (Platnick, 2014). Salticidae spider family is represented by 600 genera and 5755 species (Platnick, 2014). Within Turkish spider fauna, with a total of 330 genera and 1013 species, Salticidae is represented by 106 species of 40 genera (Bayram *et al.*, 2014). The total number of salticids recorded from Turkey is now 110 species.

Material and Methods

In this study, 231 individuals were collected from 27 different localities in the province of Kırıkkale. The samples were collected from under rocks, over residues of

rock pieces, tree branches and leaves and over the ground and from short plants. Traps, sweep net, and mouth aspirator were used for collecting the samples. Samplings were also done from various ecosystems that are not agricultural areas as well as agricultural areas. The collected samples were placed in a special solution (1 lt. 70-75% alcohol + 4-5 drops formaldehyde + 3-4 drops glycerin) and sent to the laboratory together with a label on which the place of collection, collecting date and name of the collector were written. The identification and photographing of the samples brought to the laboratory were performed by Lieca S8APO stereomicroscope and a connected Leica DC 160 camera. Species identification was performed by using the identification keys of Almquist (2006), Heimer & Nentwig (1991), Prószyński (2003), Roberts (1995), Tyschchenko (1971), and Wunderlich (2008). Scanning Electron Microscope (SEM) images were taken by JEOL JSM-5600 after coating the samples with gold using Polaron SC-500 coater. The distribution of the samples throughout the world was given according to the database of Platnick (2014) online world spider catalog. The samples that were identified and determined to species were labelled and preserved in tubes filled with 70% alcohol in Arachnology Museum of Kırıkkale University (KUAM).

Abbreviations used are as follows: Fe = femur, L = length, Mt = metatarsus, Pa = patella, Ta = tarsus, Ti = tibia, W = width. All measurements are given in millimetres.

Results

In this study, 231 spider specimens were collected from 27 different localities in the study region and 168 adult specimens among them were examined; 21 genera and 37 species were determined of Salticidae. The 37 identified species approximately represent 36% of the Turkish salticid fauna [106 species (Bayram *et al.*, 2014)]. The identified specimens in this study included 87 males (51.8%) and 81 females (48.2%). Both female and male individuals were present for 15 species only.

Aelurillus gershomi Prószyński, 2000 (Figs. 1, 2)

Material: 2♂, Keskin District, Dinek mountain (39°46'N, 33°38'E), 09.04.2011.

Recent Turkish record: Danişman *et al.* (2012).

World Distribution: Turkey, Israel (Platnick, 2014).

Aelurillus luctuosus (Lucas, 1846) (Fig. 3)

Material: 1♀, Keskin District, Dinek Mountain (39°46'N, 33°38'E), 09.04.2011.

Recent Turkish record: Danişman *et al.* (2012).

World Distribution: Mediterranean to Turkmenistan (Platnick, 2014).

Aelurillus v-insignitus (Clerck, 1757)

Material: 1♂, Keskin District, Dinek Mountain (39°47'N, 33°46'E), 19.04.2011; 1♂, Bahşılı District, Karaahmetli Village (39°39'N, 33°24'E), 04.06.2011.

World Distribution: Palearctic (Platnick, 2014).

Ballus chalybeius (Walckenaer, 1802)

Material: 1♀, Yahşihan District (39°50'N, 33°28'E), 16.06.2011; 1♂, 1♀, Yahşihan District, Irmak Town (39°55'N, 33°22'E), 14.05.2012; 1♂, Karakeçili District, Sülübük Village (39°37'N, 33°24'E), 04.06.2012; 1♀ Çelebi District, Karabucak Village (39°30'N, 33°25'E), 09.04.2012.

World Distribution: Europe, North Africa to Central Asia (Platnick, 2014).



Fig. 1. *Aelurillus gershomi* ♂. A. Prosoma, dorsal view. B. Opisthosoma, dorsal view.

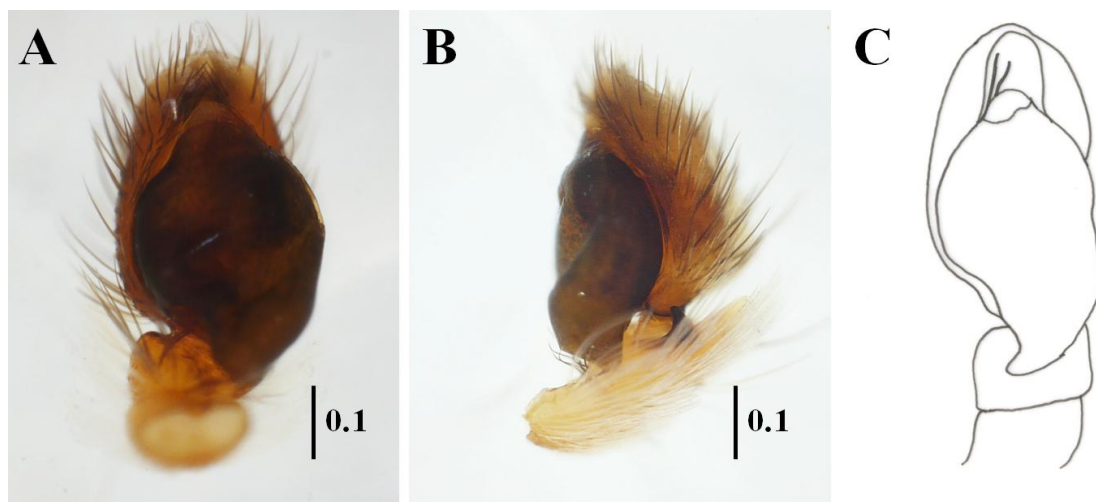


Fig. 2. *Aelurillus gershomi*, male pedipalp. A, C. ventral view. B. retrolateral view.

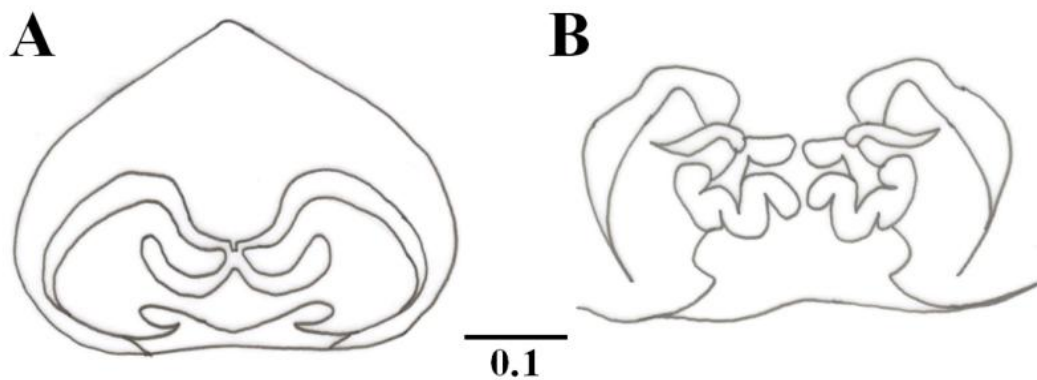


Fig. 3. *Aelurillus luctuosus*, female epigyne. A. ventral view. B. dorsal view.

Chalcoscirtus infimus (Simon, 1868)

Material: 1♂, Yahşihan District (39°52'N, 33°27'E), 04.06.2011; 2♂, Sulakyurt District (40°12'N, 33°45'E), 17.07.2012.

Recent Turkish record: Danişman *et al.* (2012).

World Distribution: Southern, Central Europe to Central Asia (Platnick, 2014).

Chalcoscirtus nigrinus (Thorell, 1875)

Material: 1♂, Karacalı Village (39°53'N, 33°32'E), 17.06.2012; 1♂, Bahşılı District (39°39'N, 33°25'E), 09.04.2012.

World Distribution: Palearctic (Platnick, 2014).

Cyrba algerina (Lucas, 1846)

Material: 6♀, Keskin District (39°40'N, 33°36'E), 05.06.2012; 1♂, 4♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011; 1♂, Yahşihan District, Irmak Town (39°55'N, 33°22'E), 14.05.2012; 1♂, 1♀, Keskin District, Hasandede Village (39°44'N, 33°31'E), 05.06.2012; 1♀, Delice District (40°06'N, 34°02'E), 18.06.2012; 1♂, Karakeçili District (39°35'N, 33°22'E), 09.04.2012; 1♂, 1♀, Çelebi District, Karabucak Village (39°30'N, 33°25'E), 09.04.2012; 2♀, Balşeyh District, Erdelek Village, (39°57'N, 33°44'E) 29.04.2011; 2♂, 1♀, Delice District, Hacıobası Village (39°58'N, 34°01'E), 21.06.2012.

World Distribution: Canary Is. to Central Asia (Platnick, 2014).

Euophrys frontalis (Walckenaer, 1802)

Material: 1♂, 1♀, Etiler District (39°51'N, 33°30'E), 29.04.2012; 1♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011; 2♂, Sulakyurt District, Sarımbey Village (40°16'N, 33°43'E), 17.07.2012; 1♂, 1♀, Sulakyurt District, Kalekışla Village (40°07'N, 33°48'E), 17.07.2012; 2♀, Bahşılı District, Karaahmetli Village (39°39'N, 33°24'E), 04.06.2011; 1♂, 1♀, Çelebi District (39°26'N, 33°32'E), 09.04.2012.

World Distribution: Palearctic (Platnick, 2014).

Euophrys rufibarbis (Simon, 1868)

Material: 2♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011; 1♀, Karakeçili District, Sülübüük Village (39°37'N, 33°24'E), 04.06.2011; 1♀, Delice District, Hacıobası Village (39°58'N, 34°01'E), 21.06.2012.

World Distribution: Palearctic (Platnick, 2014).

Habrocestum latifasciatum (Simon, 1868)

Material: 1♂, Karacalı Village (39°52'N, 33°33'E), 03.06.2012.

World Distribution: Eastern Mediterranean (Platnick, 2014).

Hasarius adansonii (Audouin, 1825)

Material: 1♂, Karacalı Village (39°52'N, 33°33'E), 03.06.2012.

World Distribution: Cosmopolitan (Platnick, 2014).

Heliophanus auratus C.L.Koch, 1835

Material: 2♂, 1♀, Yahşihan Village (39°50'N, 33°28'E), 16.06.2011.

World Distribution: Palearctic (Platnick, 2014).

Heliophanus edentulus Simon, 1871

Material: 1♂, Balşeyh District, Dinek Mountain (39°46'N, 33°38'E), 29.04.2011.

World Distribution: Mediterranean to Iran, Nigeria (Platnick, 2014).

***Heliophanus equester* L. Koch, 1867**

Material: 1♂, 1♀, Delice District (40°06'N, 34°02'E), 18.06.2012.

World Distribution: Italy to Azerbaijan (Platnick, 2014).

***Heliophanus flavipes* (Hahn, 1832)**

Material: 2♂, 1♀, Karacalı Village (39°53'N, 33°32'E), 17.06.2012.

World Distribution: Palearctic (Platnick, 2014).

***Heliophanus kochii* Simon, 1868**

Material: 1♂, Sulakyurt District (40°12'N, 33°45'E), 17.07.2012.

World Distribution: Palearctic (Platnick, 2014).

***Heliophanus lineiventris* Simon, 1868**

Material: 1♂, 1♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011.

World Distribution: Palearctic (Platnick, 2014).

***Heliophanus melinus* L. Koch, 1867**

Material: 1♂, Yahşihan District (39°52'N, 33°27'E), 04.06.2011.

World Distribution: Palearctic (Platnick, 2014).

***Heliophanus mordax* (O.P.-Cambridge, 1872)**

Material: 2♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011; 1♂, 2♀, Keskin District (39°40'N, 33°36'E), 05.06.2012; 2♂, Sulakyurt District (40°12'N, 33°45'E), 17.07.2012; 3♂, Sulakyurt District, Kalekışla Village (40°07'N, 33°48'E), 17.07.2012; 1♂, 1♀, Ahılı Village (39°47'N, 33°32'E), 23.06.2012; 1♂, 1♀, Karakeçili District (39°35'N, 33°22'E), 09.04.2012.

World Distribution: Greece to Central Asia (Platnick, 2014).

***Heliophanus tribulosus* Simon, 1868**

Material: 1♂, 1♀, Keskin District, Dinek Mountain (39°47'N, 33°46'E), 19.04.2011.

World Distribution: Europe to Kazakhstan (Platnick, 2014).

***Leptorchestes sikorskii* Prószyński, 2000 (Figs. 4-5)**

Male description: Prosoma is blackish brown, with few hairs. Clypeus is thin and intensely covered with long hairs. Chelicerae are light brown. Surrounding of frontal anterior median eyes is covered with yellowish hairs. Sternum is dark brown and has no hairs. Opisthosoma is dark brown, with a white medial ring-like pattern in the middle of the opisthosoma. Yellowish hairs are found dorsally and ventrally. Coxa, patella and tibia are yellow in leg I, while other segments are light brown. Line-shaped brown spots are prolaterally directed on patella and tibia. Leg II is yellow and has line-shaped brown spots in the prolateral direction. Leg III is light brown. Leg IV is light brown, and half of coxa and patella are yellow. Pedipalp is dark brown. Bulb is large. Embolus base is large, and its end is tapering. It has two headed tibial apophyses laterally extended (Fig. 5).

Total length: 4.70; Prosoma L 2.20, W 1.30; Opisthosoma L 2.50, W 1.50.

Leg formula: IV-I-III-II. Lengths of legs (Table 1).

Material: 1♂, Keskin District, Dinek mountain (39°47'N, 33°46'E), 19.04.2011.

World Distribution: Lebanon, Israel (Platnick, 2014).

Comment: New record for spider fauna of Turkey.

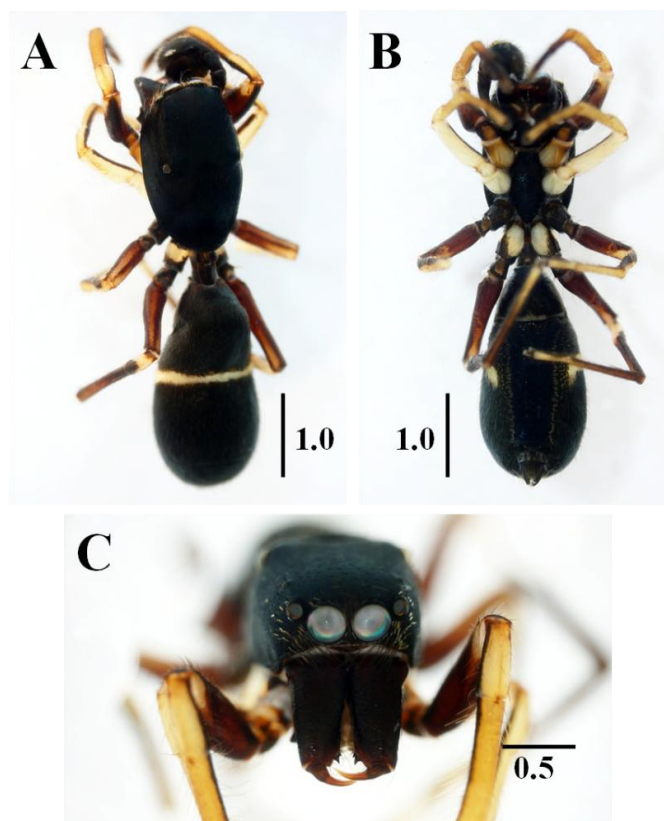


Fig. 4. *Leptorchestes sikorskii* ♂. A. dorsal view. B. ventral view. C. ocular area, frontal view.

Table 1. Measurements of the legs of *Leptorchestes sikorskii* Prószyński, 2000 male.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	1.15	0.65	1.10	0.65	0.40	3.95
II	0.90	0.50	0.70	0.50	0.35	2.95
III	1.00	0.50	0.85	0.65	0.40	3.40
IV	1.45	0.65	1.30	1.10	0.55	5.05

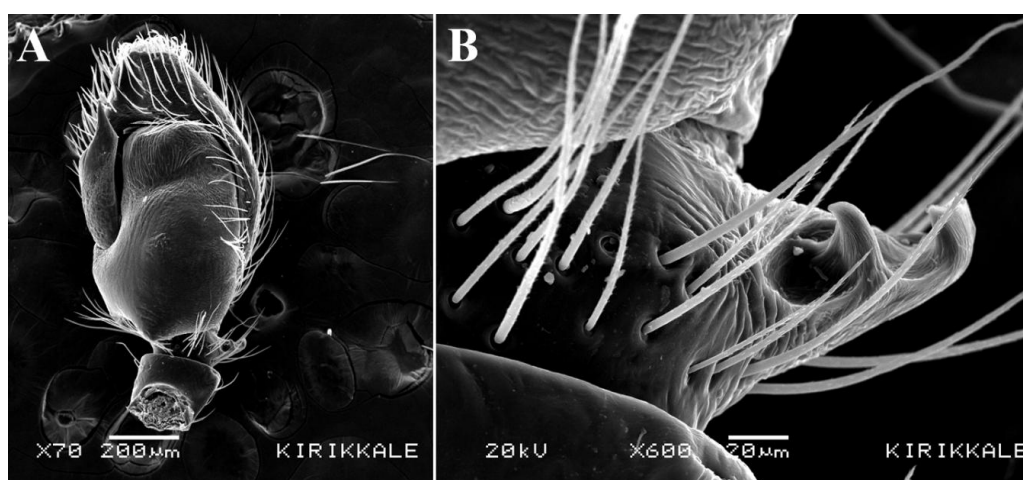


Fig. 5. *Leptorchestes sikorskii*, male pedipalp. A. ventral view. B. tibial apophysis.

***Menemerus semilimbatus* (Hahn, 1829)**

Material: 2♂, Karacalı Village (39°52'N, 33°33'E), 03.06.2012.

World Distribution: Canary Is. to Azerbaijan; Chile, Argentina, USA (Platnick, 2014).

***Neaetha absheronica* Logunov & Guseinov, 2002 (Figs. 6-7)**

Male description: Prosoma is yellow-brown. Ocular area is covered with black hairs. Anterior eyes surroundings are covered by yellow hairs. Clypeus is covered with yellow and dense white hairs. Chelicerae are brown, its anterior base is densely covered with white hairs, and its end is covered with a few white hairs. Middle sternum is yellow; parts near to coxae are brown and covered by dense white hairs. Opisthosoma is yellow, with grey-brown pattern. Leg I tarsus yellow, other segments dark-brown, other legs yellow. Segments of legs II and III are with brownish patches. Pedipalps are yellow-brown. Base of embolus thick, its tip is thin (Fig. 7B-C).

Male total length: 3.70; Prosoma L 1.80, W 1.35; Opisthosoma L 1.90, W 1.20.

Leg formula I-III-IV-II. Lengths of legs (Table 2).

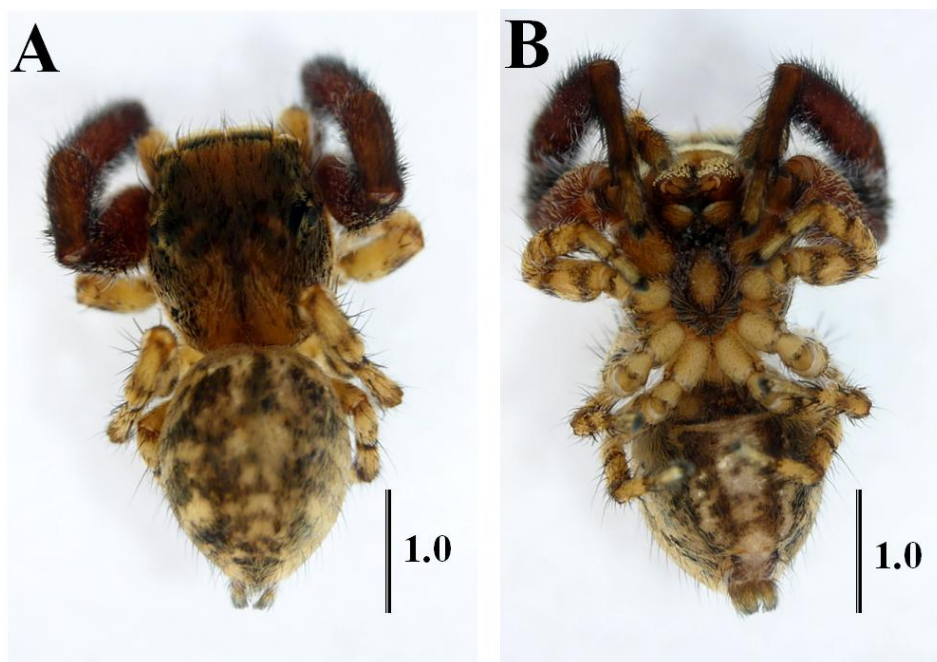


Fig. 6. *Neaetha absheronica* ♂. A. dorsal view. B. ventral view.

Table 2. Measurements of the legs of *Neaetha absheronica* Logunov & Guseinov, 2002 male.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	1.35	0.65	1.15	0.75	0.50	4.40
II	0.70	0.35	0.45	0.30	0.30	2.10
III	1.40	0.55	0.80	0.40	0.45	3.60
IV	0.80	0.35	0.50	0.40	0.45	2.50

Material: 1♂, Delice District, Bozköy Village (40°06'N, 34°02'E), 18.06.2012.

World Distribution: Macedonia, Azerbaijan (Platnick, 2014).

Comment: New genus and species record for the spider fauna of Turkey.

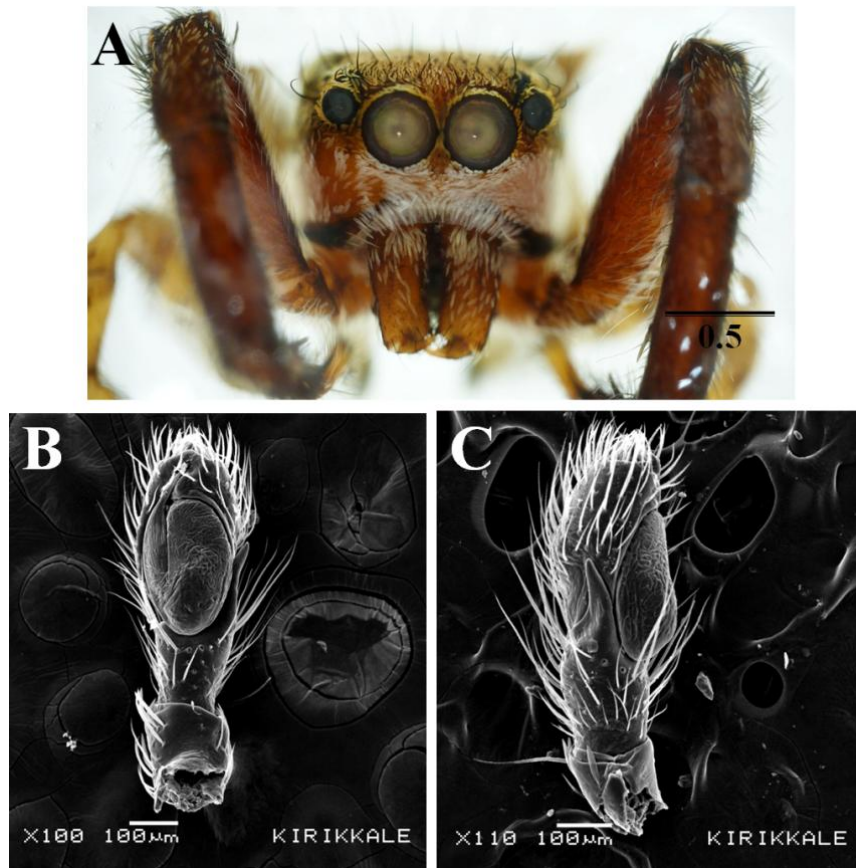


Fig. 7. *Neaetha absheronica* ♂. A. ocular area, frontal view. B-C. Pedipalp. B. ventral view. C. retrolateral view.

Neon reticulatus (Blackwall, 1853)

Material: 3♀, Sulakyurt Dsistrict (40°12'N, 33°45'E), 17.07.2012.

World Distribution: Holarctic (Platnick, 2014).

Pellenes flavipalpis (Lucas, 1853)

Material: 1♀, Yahşihan District, Irmak Town (39°55'N, 33°22'E), 14.05.2012.

World Distribution: Greece, Crete, Cyprus (Platnick, 2014).

Philaeus chrysops (Poda, 1761)

Material: 1♂, 7♀, Keskin District (39°40'N, 33°36'E), 05.06.2012; 4♀, Yahşihan District, Irmak Town (39°55'N, 33°22'E), 14.05.2012; 2♂, 7♀, Balışeyh District, Dinek Mountain (39°46'N, 33°38'E), 29.04.2011; 1♂, 1♀, Balışeyh District, Erdelek Village (39°57'N, 33°44'E), 29.04.2011; 1♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011; 3♂, Sulakyurt District (40°12'N, 33°45'E), 17.07.2012; 2♂, Çelebi District, Karabucak Village (39°30'N, 33°25'E), 09.04.2012.

World Distribution: Palearctic (Platnick, 2014).

Phintella castrisiana (Grube, 1861)

Material: 1♂, Yahşihan District (39°50'N, 33°28'E), 16.06.2011; 1♂, 1♀, Karacalı Village (39°52'N, 33°33'E), 03.06.2012.

World Distribution: Palearctic (Platnick, 2014).

Phlegra bresnieri (Lucas, 1846)

Material: 1♂, Etiler District (39°51'N, 33°30'E), 29.04.2012, 1♂, Yahşihan District, Irmak Town (39°55'N, 33°22'E), 14.05.2012; 1♂, 1♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011.

World Distribution: Southern Europe to Azerbaijan, Africa (Platnick, 2014).

Phlegra fasciata (Hahn, 1826)

Material: 1♀, Ahılı Village (39°47'N, 33°32'E), 23.06.2012.

World Distribution: Palearctic (Platnick, 2014).

Phlegra lineata (C.L. Koch, 1846)

Material: 2♂, Karacalı Village (39°53'N, 33°32'E), 17.06.2012; 1♂, Keskin District (39°40'N, 33°36'E) 05.06.2012; 1♂, Yahşihan District (39°52'N, 33°27'E), 04.06.2011.

World Distribution: Southern Europe, Syria (Platnick, 2014).



Fig. 8. *Plexippus clemens* ♀. A. dorsal view. B. ventral view. C. ocular area, frontal view.

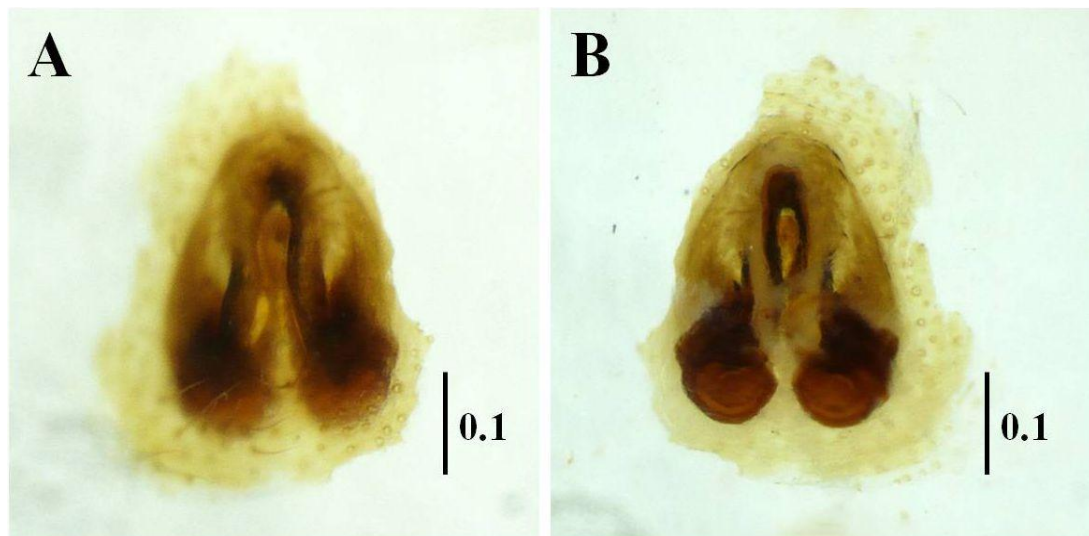


Fig. 9. *Plexippus clemens* ♀. A. Epigyne, ventral view. B. Vulvae, dorsal view.

Plexippus clemens (O.P.-Cambridge, 1872) (Figs. 8-9)

Female description: Prosoma is yellowish-brown. Eye region is brown. Surrounding of posterior eyes is covered by black hairs. Surrounding of frontal eyes is covered by a few white hairs. Clypeus is yellow with a few white hairs. Chelicerae are yellow and dorsally covered by transparent hairs. Opisthosoma is white and its sides are covered by grayish-brown hairs. Legs are yellow and hairy. Only metatarsus and tarsus are brown. Epigyne and vulvae as in Figure (9A-B).

Total length: 5.20; Prosoma L 2.50, W 1.85; Opisthosoma L 2.70, W 1.60.

Leg formula: IV-III-I-II. Lengths of legs (Table 3).

Table 3. Measurements of the legs of *Plexippus clemens* (O.P.-Cambridge, 1872) female.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	1.30	1.05	1.00	0.80	0.60	4.75
II	1.50	0.90	0.90	0.80	0.60	4.70
III	1.60	0.80	0.95	0.95	0.60	4.90
IV	1.70	0.80	1.20	1.30	0.90	5.90

Material: 1♀, Balıseyh District, Dinek Mountain (39°46'N, 33°38'E), 29.04.2011.

World Distribution: Libya, Israel, Yemen, Iran (Platnick, 2014).

Comment: New record for spider fauna of Turkey.

Plexippus paykulli (Audouin, 1825)

Material: 2♂, 1♀, Karacalı Village (39°53'N, 33°32'E), 17.06.2012. 1♂, 1♀, Yahşihan District (39°50'26''K, 33°28'38''D), 16.06.2011.

World Distribution: Cosmopolitan (Platnick, 2014).

Pseudeuophrys obsoleta (Simon, 1868)

Material: 4♂, Central (39°51'N, 33°30'E), 29.04.2012; 5♂, Yahşihan District (39°50'N, 33°28'E), 16.06.2011; 1♂, Keskin District, Dinek Mountain (39°47'N, 33°46'E), 19.04.2011; 3♀, Delice District, Bozköy Village (40°06'N, 34°02'E), 18.06.2012; 3♂, 2♀, Delice District, Hacıobası Village (39°58'N, 34°01'E), 21.06.2012; 2♂, 4♀, Yahşihan District (39°52'N, 33°27'E), 04.06.2011.

World Distribution: Palearctic (Platnick, 2014).

Pseudicius kulczynskii Nosek, 1905

Material: 1♀, Keskin District, Dinek Mountain (39°47'N, 33°46'E), 19.04.2011; 2♂, Yahşihan District, Irmak Town (39°55'N, 33°22'E) 14.05.2012.

World Distribution: Greece, Turkey, Syria (Platnick, 2014).

Sitticus ammophilus (Thorell, 1875)

Material: 1♂, Yahşihan District (39°52'N, 33°27'E), 04.06.2011.

World Distribution: Russia, Central Asia, Canada (Platnick, 2014).

Sitticus pubescens (Fabricius, 1775)

Material: 1♂, Keskin District, Dinek Mountain (39°47'N, 33°46'E).

World Distribution: Europe, Russia, USA (Platnick, 2014).

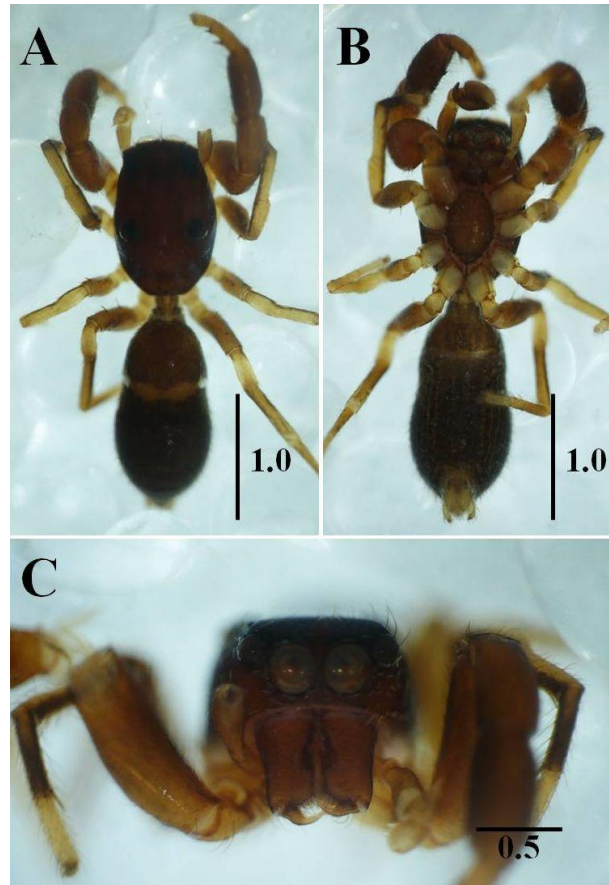


Fig. 10. *Synageles albotrimaculatus* ♂. A. dorsal view. B. ventral view. C. ocular area, frontal view.

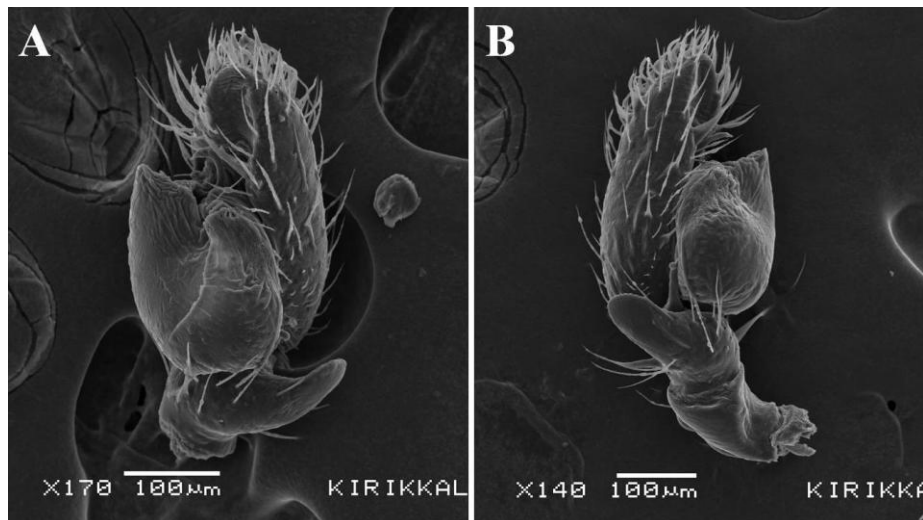


Fig. 11. *Synageles albotrimaculatus*, male pedipalp. A. ventral view. B. retrolateral view.

Synageles albotrimaculatus (Lucas, 1846) (Figs. 10-11)

Male description: Prosoma is glossy dark-brown. Chelicerae are fawn-coloured. Ocular area is punctated. Opisthosoma is blackish-brown and elongated. Dorsum is covered with 2 bright scuta connected by bright transverse line, laterally two spots formed by white scale-like hairs. Legs I thick, with dark-brown tibiae. Pedipalp tibia with two apophyses.

First tibial apophysis is broad and flat. Second tibial apophysis is spike shaped, between first one and bulb. Embolus short and thin (Fig. 11A-B).

Total length: 2.85; Prosoma L 1.30, W 0.90; Opisthosoma L 1.55, W 0.85.

Leg formula: I-IV-II-III. Lengths of legs (Table 4).

Table 4. Measurements of the legs of *Synageles albotrimaculatus* (Lucas, 1846) male.

Legs	Fe	Pa	Ti	Mt	Ta	Total
I	0.35	0.21	0.26	0.15	0.10	1.07
II	0.27	0.13	0.19	0.15	0.13	0.87
III	0.25	0.13	0.14	0.12	0.10	0.74
IV	0.28	0.16	0.29	0.20	0.14	1.07

Material: 1♂, Balıyehir District, Dikmen Village (39°46'N, 33°38'E), 29.04.2011.

World Distribution: Spain, France, Italy, Algeria, Tunisia (Platnick, 2014).

Comment: New record for spider fauna of Turkey.

Acknowledgments

We wish to thank Kırıkkale University Scientific and Technological Research Laboratories (KUBTAL) for SEM facilities. This work was supported in part by the KKU-BAB grant 2012-22.

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The first record of genus *Acartauchenius* Simon, 1884 (Araneae, Linyphiidae) in Turkey

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Abstract

Acartauchenius scurrilis (O.P.-Cambridge, 1872) is recorded for the first time from Turkey and is added to its araneofauna. The characteristic features and photographs of this newly recorded species are presented. The total number of linyphiid species recorded from Turkey is now 117.

Keywords: Spiders, Araneae, Linyphiidae, *Acartauchenius scurrilis*, new record, Taxonomy, Turkey.

Introduction

Linyphiidae is one of the largest spider families with 4490 species that belong to 591 genera and it has a worldwide distribution (Platnick, 2014). Genus *Acartauchenius* Simon, 1884 includes 17 species in the Palearctic region.

Until now, 116 linyphiid spider species belonging to 64 genera have been recorded from Turkey (Bayram *et al.*, 2014). This paper deals with the characteristic features and distribution of *Acartauchenius scurrilis* (O.P.-Cambridge, 1872) adding a new species to the araneo-fauna of Turkey.

Material and Methods

The specimen of *A. scurrilis* was found under a stone and collected by hand aspirator during daytime. The specimen was preserved and studied in 70% ethanol using a Leica S8APO microscope and photographed by means of a Leica DC 160 camera. It is deposited in the collection of the Arachnological Museum of Kastamonu University (KASUAM). Well known identification keys were used for identification (Tyschchenko, 1971; Roberts, 1987; Heimer & Nentwig, 1991). All measurements are given in millimetres.

Results

Acartauchenius scurrilis (O.P.-Cambridge, 1872) (Fig. 1)

Material examined: 1♂, Bartın Province, Amasra District, (41°43'N, 32°22'E), from a garden, 11.09.2011, leg. Z. Sancak; (KASUAM-LIN.Aca.scur.01).

Description of male:

Body length 2.01; Prosoma length 0.94, width 0.5; Opisthosoma length 1.06, width 0.85. Prosoma is brown and its shape in lateral view as in Fig. (1A). Male carapace is raised in head region with rounded cephalic lobe which is covered by numerous long hairs. Opisthosoma is greyish-yellow, dorsally with bright transverse stripes. Legs are yellowish-brown. Male palp as in Fig. (1B). Leg formula: I-IV-II-III (Table 1).

Table 1. Measurements of the legs of the *Acartauchenius scurrilis* ♂.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.8	0.10	0.6	0.5	0.4	2.40
II	0.8	0.10	0.5	0.5	0.4	2.30
III	0.7	0.10	0.5	0.3	0.4	2.00
IV	0.7	0.12	0.6	0.5	0.4	2.32

Distribution: Palearctic (Platnick, 2014).

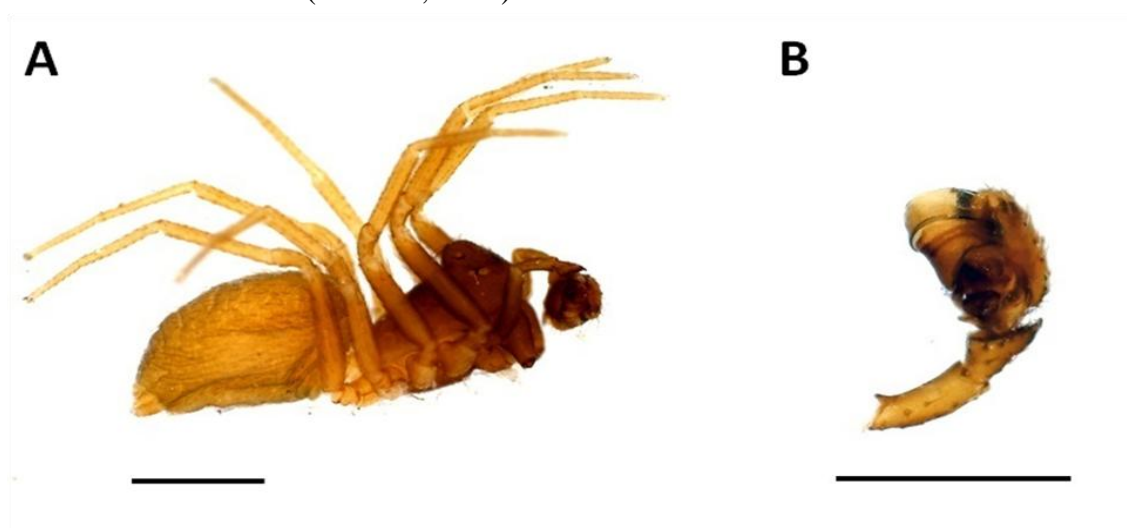


Fig. 1. *Acartauchenius scurrilis* ♂. A. Habitus, lateral view. B. Pedipalp, retrolateral view. (scales = 0.5 mm).

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The first record of *Levymanus gershomi* in Saudi Arabia (Araneae, Palpimanidae)

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Abstract

Levymanus gershomi Zonstein & Marusik, 2013 of family Palpimanidae is recorded from Al-Baha, Saudi Arabia. It is the first record of this species outside its type locality.

Keywords: Spiders, Palpimanidae, *Levymanus gershomi*, Al-Baha, Saudi Arabia.

Introduction

Family Palpimanidae Thorell, 1870 was recorded from Saudi Arabia few months ago for the first time (El-Hennawy, 2014). The available material was only one unidentified female specimen. Now, the identification of that specimen is possible with the help of the work of Zonstein & Marusik (2013) to say that it is *Levymanus gershomi* Zonstein & Marusik, 2013. Thus, this female specimen is the first one of this species outside its type locality [the vicinity of Qetura (Ktura), Arava Valley (29°58'N, 35°03'E)]. The distribution of the species is extended about 1300 km south-eastwards (Fig. 1).

Al-Baha Province is situated in the south-western part of Saudi Arabia between the Holy Makkah and Asir Regions. It is the smallest province in the kingdom of Saudi Arabia (about 10362 km²), situated between longitudes 41°/42° E and latitudes 19°/20° N. Due to its location, Al-Baha's climate is moderate in summer and cold in winter. It has about 53 forests. It is characterized by natural tree cover and agricultural plateaus. The region is divided by huge and steep rocky mountains into two main sectors, a lowland coastal plain at the west, known as "Tihama", and a mountainous area with an elevation of 1500 to 2450 m above sea level at the east, known as "Al-Sarat or Al-Sarah" which form a part of Al-Sarawat Mountains range (El-Hawagry *et al.*, 2013).

A preliminary study carried out on the insect fauna of Al-Baha Province, south-western part of Saudi Arabia recorded 582 species and subspecies belonging to 129 families and representing 17 orders. The insect faunal composition in Al-Baha Province has an Afrotropical flavour, with the Afrotropical elements predominant, and a closer

affiliation to the Afrotropical region than to the Palaearctic region or the Eremic zone (El-Hawagry *et al.*, 2013).



Fig. 1. Map of the Arabian Peninsula showing the distribution of *Levymanus gershomi*.
* = type locality in Arava Valley. * = new record locality: Raghadan, Al-Baha.

Eight orders of class Arachnida were recorded from Saudi Arabia: Araneae, Scorpiones, Pseudoscorpiones, Solifugae, Opiliones, Palpigradi, Amblypygi, and Acari. Among the 25 families, 69 genera, and 77 species of spiders (Araneae) recorded from Saudi Arabia, only 16 genera and 8 species were identified from Al-Baha; belonging to 15 families (El-Hennawy, 2014).

List of spiders, Order Araneae, recorded from Al-Baha (leg. El-Hawagry 2011-2012)

Family Agelenidae: *Agelena* sp.? Gebel El-Baher.

Family Araneidae: *Larinia* ? sp. Gebel El-Baher, Al-Mekhwa.

Family Corinnidae: ? Dhee Ain.

Family Gnaphosidae: *Micaria* sp. Dhee Ain,

Pterotricha dalmasi Fage, 1929 Ghabet Shohba, Raghadan *.

Family Linyphiidae: ? Al-Mekhwa.

Family Lycosidae: *Arctosa* ? sp. Dhee Ain.

Family Miturgidae: *Cheiracanthium molle* L. Koch, 1875 Gebel El-Baher.

Family Oxyopidae: *Oxyopes* sp. Al-Mekhwa.

Family Palpimanidae: ? Raghadan *.

Family Philodromidae: *Thanatus* sp. Raghadan *, Ghabet Shohba, Al-Mekhwa.

Tibellus vossioni Simon, 1884 Gebel El-Baher, Ghabet Shohba.

Family Pholcidae: ? Dhee Ain.

Family Salticidae: *Heliophanus saudis* Prószyński, 1989 W. Turabet Zahran.

Thyene imperialis (Rossi, 1846) Al-Mekhwa.



Figs. 3-10. *Levymanus gershomi* Zonstein & Marusik, 2013 ♀. 3-5. Habitus. 3. Dorsal view. 4. Ventral view. 5. Lateral view. 6. Cephalothorax, dorsal view (→ fovea). 7-8. Legs I & II, lateral view. 9. Epigastral scutum and epigynum, ventral view. 10. Abdomen tip, ventral view, showing encircled spinnerets.

Description: Female (Figs. 3-5): TL 4.4; Cephalothorax: carapace, sternum and labium crimson red. Chelicerae, pedipalps, coxa and femur I light reddish orange, other segments of leg I and entire legs II–IV yellow. Carapace with corrugated cuticle, diamond-oval in shape, narrowed anteriorly and posteriorly. Cephalic part slightly raised behind eye area, inclining in the thoracic part (Fig. 5). Thoracic fovea short and bipartite, with two separate sulci located side by side (Fig. 6). CL 2.0, CW 1.0, anterior margin 0.5; Pedicel L 0.44; Sternum L 1.04, W 0.8; Labium triangular L 0.22, W 0.3. Eyes: anterior medians (AME) largest, about three times larger than the other subequal six eyes. ALE and PLE contiguous. PME widely spaced from each other, as well as from AMEs and from PLEs. Eye measurements (diameters and inter-distances): AME 0.10, ALE 0.03, PME 0.04, PLE 0.03, AM-AM 0.16, AM-AL 0.07, PM-PM 0.14, PM-PL 0.12, AM-PM 0.07. Legs: long and slender, leg formula I-IV-II-III (Table 1). Leg I femur swollen, longer than other segments; patella longer than tibia. Patella, tibia, and metatarsus with weakly developed prolateral scopula of long hair brush (Fig. 7). Legs II-IV with metasomal scopula (Fig. 8). Leg tarsi slightly curved, without scopulae. Claw tufts weakly developed. Leg tarsi with two narrow dentate claws.

Table 1: Legs measurements (mm)

Leg	I	II	III	IV
Femur	1.40	1.00	0.84	1.20
Patella	1.10	0.63	0.50	0.56
Tibia	0.82	0.63	0.70	0.90
Metatarsus	0.54	0.62	0.58	1.10
Tarsus	0.54	0.52	0.36	0.48
Total length	4.40	3.40	2.98	4.24

Abdomen: dirty white without dorsal pattern; L 2.4, W 2.15. Epigastral scutum and epigynum (Fig. 9). Spinnerets are strongly reduced, encircled by a sclerotised ring (Fig. 10).

Acknowledgment

I am grateful to Dr. Magdi S. El-Hawagry, Professor of Insect taxonomy, Cairo University and formerly in Al-Baha University, Al-Baha, Saudi Arabia, who collected the studied specimen during his supervision of the project "Survey and Classification of Agricultural and Medical Insects in Al-Baha District", supported by the Deanship of Scientific Research of Al-Baha University.

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Two new records of genus *Zodarion* from Turkey (Araneae, Zodariidae)

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Abstract

Zodarion confusum Denis, 1935 and *Z. ruffoi* Caporiacco, 1951 are reported for the first time from Turkey. Digital photographs of genitalia of the newly recorded species are presented together with their zoogeographical distribution.

Keywords: Spiders, Araneae, Zodariidae, *Zodarion confusum*, *Zodarion ruffoi*, new record, Turkey.

Introduction

The checklist of the spiders of Turkey includes 1013 species in 53 families (Bayram *et al.*, 2014). Studies on the diversity of Turkish spider fauna have not been completed and with each passing day new spider species and new records are added. In particular, family Zodariidae is little known in our country, with only 19 species belonging to 4 genera previously reported (Bayram *et al.*, 2014).

Material and Methods

Specimens belonging to the Zodariidae, Gnaphosidae and Miturgidae families were collected from the Turgutlu district of Manisa province in western Turkey during May-October 2003. They were caught using pitfall traps of 200 ml cups buried in the soil in such a way as to position the lip of the trap at ground level. Traps were half filled with a mixture of ethylene glycol and water at 1:1 ratio (Anlaş *et al.*, 2010). A total of five pitfall traps were placed in biotopes that have different altitudes described as Chestnut biotope (*Castanea sativa* Miler, 620m), Pines forest (*Pinus brutia* Ten., *Pinus nigra* (Arnold), *Cistus laurifolius* L. and *Polypodium* sp. 930m), Oak forest (*Quercus ithaburensis* Dacne. ssp. *macrolepis* (Kotschy), *Quercus infectoria* Olivier, *Cistus*

creticus L., *Pyrus amygdaliformis* Vill, *Astragalus* sp., 980m), and Fire-influenced biotopes (*Rosa canina* L., *Cistus lauriformis* L., *Thymus longicaule* and there are burnt wood pieces and trees, 960m). Then, collected materials were deposited in University of Gaziantep, Zoology Museum (GAUZM, Department of Biology, Gaziantep, Turkey). The two species were identified according to Bosmans (1997) and Nentwig *et al.* (2014).

Results

Family Zodariidae Thorell, 1881

Zodarion confusum Denis, 1935 (Figs. 1-2)

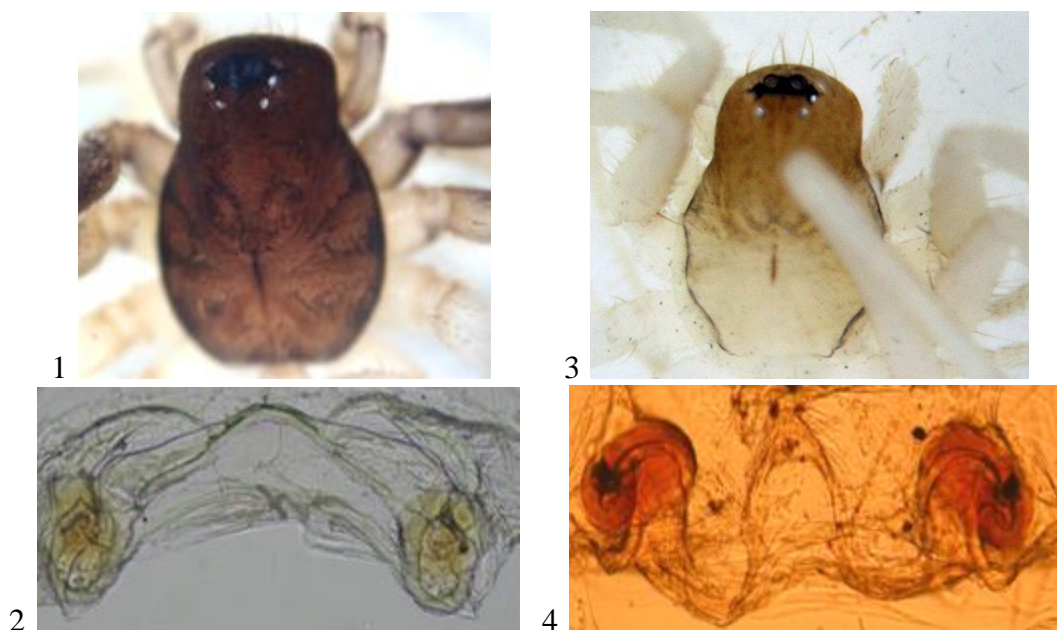
Material examined: 2♀♀, Manisa province, Turgutlu district, Dağmarmara area, 38°22'49"N 28°04'56"E, 880m elevation, Meadow, 27.09.2003; 1♀, Manisa province, Turgutlu district, Dağmarmara area, 38°22'07"N 27°50'16"E, 960m elevation, fire-influenced biotopes, 29.10.2003.

World Distribution: Italy (Platnick, 2014).

Zodarion ruffoi Caporiacco, 1951 (Figs. 3-4)

Material examined: 3♀♀, Manisa province, Turgutlu district, Dağmarmara area, 38°22'44"N 27°52'12"E, 930m, pine forest, 15.07.2003; 1♀, Manisa province, Turgutlu district, Dağmarmara area, 38°22'44"N 27°52'12"E, 930m elevation, pine forest, 27.08.2003; 1♀, Manisa province, Turgutlu district, Dağmarmara area, 38°22'14"N 27°50'39"E, 980m elevation, oak forest, 15.07.2003.

World Distribution: France, Italy (Platnick, 2014).



Figs. 1-2. *Zodarion confusum* Denis, 1935. 3-4. *Zodarion ruffoi* Caporiacco, 1951.
1, 3. Prosoma dorsal view. 2, 4. Vulvae.

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New data and records of spiders from North-Eastern Iran (Arachnida: Araneae)

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Abstract

This paper presents the results of a faunistic survey of spiders inhabiting agricultural crops in different locations of Razavi Khorasan province in North-Eastern Iran. Fifteen species belonging to 15 genera of 14 families were determined. Ten species are recorded for the fauna of Razavi Khorasan for the first time, including three species namely *Zelotes puritanus* Chamberlin, 1922, *Pardosa azerifalcata* Marusik, Guseinov & Koponen, 2003 and *Heliophanus aeneus* (Hahn, 1832), which are recorded for the first time from Iran.

Keywords: Araneae, fauna, natural enemies, north-eastern Iran.

Introduction

Spiders are one of the most abundant predatory groups in the terrestrial ecosystems. Protection and promotion of these natural enemies in agro-ecosystems depend on the knowledge about their phenology, habitat preference and behaviour. To obtain such information, the first step is to know species composition of spiders inhabiting different field crops.

The world spider fauna is comprised of 44906 described species that are classified into 3935 genera of 114 families (Platnick, 2014). Despite an increase in the studies on Iranian spiders during recent years, there are still many regions of the country that remain insufficiently investigated. Ghavami (2006) summarized the literature and gave a list of 244 species belonging to 33 families. In the following years, many faunistic and taxonomic studies have been conducted by Iranian researchers in different localities in Iran (Ghavami *et al.*, 2007a; Ghavami *et al.*, 2007b; Ghahari & Marusik, 2009; Moradmand & Jäger, 2011; Kashefi *et al.*, 2013; Mirshamsi *et al.*, 2013; Hosseini *et al.*, 2014; Zamani, 2014a; Zamani, 2014b). As a result, the total number of spider species

recorded from Iran has increased to more than 500 species of more than 40 families (Zamani *et al.*, 2014). Reviewing the literature, it became clear that the spider fauna of Iran is not yet completely studied and would benefit from further detailed studies.

Material and Methods

During 2012-2013, a faunistic survey of spiders in different locations of Razavi Khorasan province, Northeast of Iran (Fig. 1) was conducted. The survey was carried out mainly in cereals, alfalfa and sugar beet in an agro-ecosystem of fields often surrounded by sparse hedgerows of trees including apples, apricot, cherry, plum, walnuts and almonds. A few specimens from other ecosystems such as municipal green spaces and parks were also included in the collected material. Various sampling methods such as hand collecting, pitfall trapping, or sweeping were used. Specimens were preserved in 70% ethanol and studied using a Nikon SMZ-1 stereo microscope. Identification of most specimens was made according to Almquist (2006), Levy (1999), Le Peru (2011), Nentwig *et al.* (2014) and Prószyński (2003). World distribution is according to Platnick (2014). Specimens were deposited at the collection of Department of Plant Protection, Ferdowsi University of Mashhad (FUMC) and Jalal Afshar Zoological Museum of University of Tehran (JAZM).

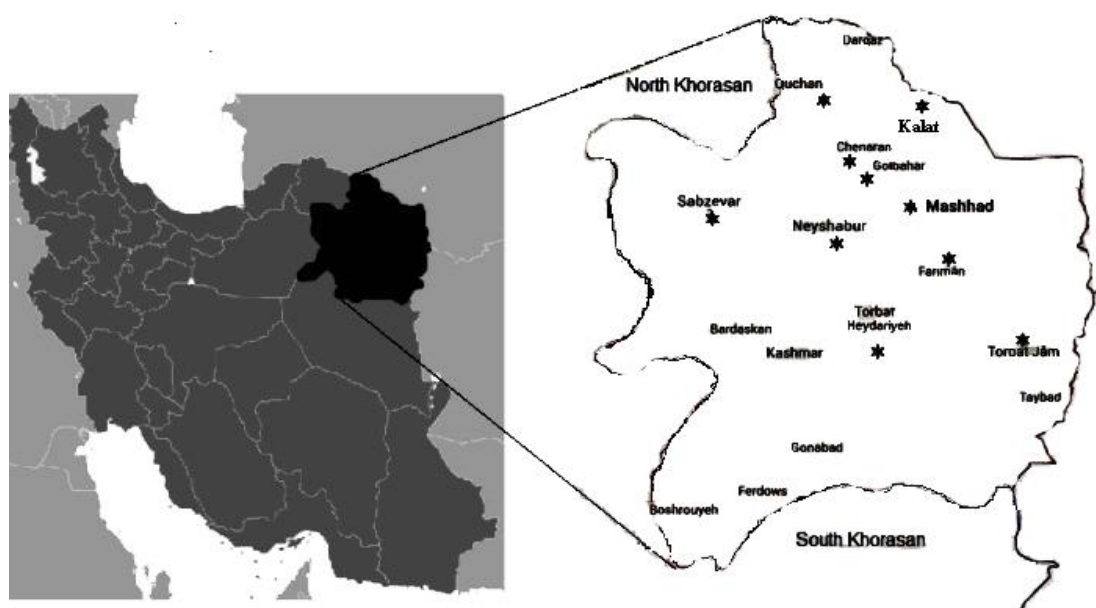


Fig. 1. Map of Iran, with Razavi Khorasan province enlarged (* = collection locality).

Results

Family Araneidae Clerck, 1757

Argiope lobata (Pallas, 1772)

Material: 2♀, Iran: Razavi Khorasan, Sabzevar, 36°13'N, 57°40'E, 20 May 2013, leg. Kaykhosravi.

World distribution: Old World.

Distribution in Iran: Ardebil, Fars, Kerman, Mazandaran, Razavi Khorasan, Southern Khorasan, Tehran, and Zanjan.

Family Eresidae C.L. Koch, in Berendt, 1845

Stegodyphus pacificus Pocock, 1900

Material: 1♀, Iran: Razavi Khorasan, Mashhad, Ferdowsi University Campus, 36°18'N, 59°36'E, 8 June 2013, leg. Kaykhosravi.

World distribution: Jordan, Iran, Pakistan and India.

Distribution in Iran: Kerman, Razavi Khorasan, Southern Khorasan, and Tehran.

Family Eutichuridae Lehitnen, 1967

Cheiracanthium montanum L. Koch, 1877

Material: 6♀, Iran: Razavi Khorasan, Quchan, 37°06'N, 58°30'E, 15 May 2012, leg. Sadeghi; 2♂, Iran: Razavi Khorasan, Mashhad, Kalat-e Naderi, 36°24'N, 59°09'E, 5 September 2013, leg. Sadeghi.

World distribution: Palearctic.

Distribution in Iran: Golestan. First record for Razavi Khorasan.

Family Gnaphosidae Pocock, 1898

Zelotes puritanus Chamberlin, 1922

Material: 1♂, Iran: Razavi Khorasan, Neyshabur, Corn field in Darrud, 36°08'N, 59°07'E, 3 September 2012, leg. Sadeghi.

World distribution: Holarctic.

Distribution in Iran: Razavi Khorasan. This species is recorded here for the first time from Iran.

Differential diagnosis: Females are diagnosed by their longer than wide epigynal plate, which is anteriorly with wide curved margins, and by broad proximal part of copulatory ducts. Males are diagnosed by their retrolateral palp apophysis, which is as long as tibia, and by the curved, retrolateral, end notched median apophysis (Almqvist, 2006).

Family Lycosidae Sundevall, 1833

Pardosa azerifalcata Marusik, Guseinov & Koponen, 2003

Material: 1♀, Iran: Razavi Khorasan, Shandiz, 36°19'N, 59°13'E, 30 April 2013, leg. Sadeghi.

World distribution: Azerbaijan, and Iran (new record).

Distribution in Iran: Razavi Khorasan. This species is recorded here for the first time from Iran.

Differential diagnosis: Females can be diagnosed by longer apical part of the epigynal septum and thinner receptacles. Males are diagnosed by different shape of palea, terminal apophysis, tegular apophysis and embolus (Marusik *et al.*, 2003).

Family Oxyopidae Thorell, 1870

Oxyopes lineatus Latreille, 1806

Material: 3♀, Iran: Razavi Khorasan, Torbat-e-Jam, Bezd village 20 Km south Torbat-e Jam, 35°12'N, 60°26'E, 6 August 2013, leg. Sadeghi; 1♀, Iran: Razavi Khorasan, Mashhad, Golmakan, 36°27'N, 59°09'E, 14 June 2013, leg. Sadeghi.

World distribution: Palearctic.

Distribution in Iran: Eastern or Western Azarbayjan, Golestan, Razavi Khorasan, and Tehran.

Family Philodromidae Thorell, 1870

Tibellus oblongus (Walckenaer, 1802)

Material: 7♀, Iran: Razavi Khorasan, Chenaran, 36°64'N, 59°12'E, 21 May 2013, leg. Sadeghi; 3♀, Iran: Razavi Khorasan, Torghabeh, 36°17'N, 59°20'E, 3 June 2013, leg. Sadeghi.

World distribution: Holarctic.

Distribution in Iran: Ardebil, Tehran, Gilan, Golestan, Mazandaran. First record for Razavi Khorasan.

Family Pisauridae Simon, 1890

Pisaura mirabilis (Clerck, 1757)

Material: 1♂, Iran: Razavi Khorasan, Mashhad, Campus of Ferdowsi University, 36°18'N, 59°36'E, 31 June 2013, leg. Kaykhosravi.

World distribution: Palearctic.

Distribution in Iran: Ardebil, Fars, Gilan, Golestan, Mazandaran, and Semnan. First record for Razavi Khorasan.

Family Salticidae Blackwall, 1841

Heliophanus aeneus (Hahn, 1832)

Material: 4♀, Iran: Razavi Khorasan, Mashhad, 36°18'N, 59°36'E, 2 September 2013, leg. Sadeghi; 1♀, Iran: Razavi Khorasan, Neyshabur, Ghadamgah, 36°26'N, 58°44'E, 3 September 2012, leg. Sadeghi.

World distribution: Palearctic.

Distribution in Iran: Razavi Khorasan. This species is recorded here for the first time from Iran.

Differential diagnosis: Males are diagnosed by long and slightly bent tibial apophysis. Females are diagnosable by their epigynal groove which is approximately one diameter apart from posterior epigynal margin (Žabka, 1997).

Thyene imperialis (Rossi, 1846)

Material: 1♀, Iran: Razavi Khorasan, Mashhad, 36°18'N, 59°36'E, 8 July 2013, leg. Kaykhosravi; 9♀, Iran: Razavi Khorasan, Torbat-e-Heydarieh, 35°16'N, 59°13'E, 19 August 2013, leg. Sadeghi.

World distribution: Old World.

Distribution in Iran: Gilan, Mazandaran, Fars, Ardebil, Tehran, Golestan, Zanjan, Markazi, Khuzestan. First record for Razavi Khorasan.

Family Sparassidae Bertkau, 1872

Olios sericeus (Kroneberg, 1875)

Material: 1♀, Iran: Razavi Khorasan, Mashhad, Imam Taghi village, 35°57'N, 59°26'E, 26 July 2013, leg. Kaykhosravi.

World distribution: Georgia, and Central Asia.

Distribution in Iran: Tehran. First record for Razavi Khorasan.

Family Theridiidae Sundevall, 1833

Phylloneta impressa (L. Koch, 1881)

Material: 5♀, Iran: Razavi Khorasan, Jaghargh, 36°12'N, 59°12'E, 13 September 2013, leg. Kaykhosravi; 2♀, Iran: Razavi Khorasan, Chenaran, 36°64'N, 59°12'E, 30 May 2012, leg. Sadeghi.

World distribution: Holarctic.

Distribution in Iran: Ardebil, Fars, Golestan, and Tehran. First record for Razavi Khorasan.

Family Thomisidae Sundevall, 1833

Xysticus ninnii fusciventris Crome, 1965

Material: 2♂, Iran: Razavi Khorasan, Mashhad, Torogh Forest Park, 37°08'N, 59°30'E, 18 September 2012, leg. Sadeghi.

World distribution: Eastern Europe to Mongolia.

Distribution in Iran: Tehran. First record for Razavi Khorasan.

Family Titanocidae Lehtinen, 1967

Nurscia albomaculata (Lucas, 1846)

Material: 3♀, Iran: Razavi Khorasan, Mashhad, 36°18'N, 59°36'E, 3 June 2013, leg. Sadeghi; 1♀, Iran: Razavi Khorasan, Quchan, 37°06'N, 59°34'E, 10 October 2013, leg. Sadeghi.

World distribution: Europe, Egypt to Central Asia.

Distribution in Iran: Golestan, Mazandaran, and Razavi Khorasan.

Family Uloboridae Thorell, 1869

Uloborus walckenaerius Latreille, 1806

Material: 5♀, Iran: Razavi Khorasan, Mashhad, 36°18'N, 59°36'E, 25 May 2013, leg. Kaykhosravi.

World distribution: Palearctic.

Distribution in Iran: Golestan, Lorestan, Razavi Khorasan, and Tehran.

Discussion

Feeding on a wide range of insects and other arthropods implies that spiders can act as biological control agents of many pests in agro-ecosystems. However, before any research on their host preference and efficiency is conducted, it is necessary to know the species composition of this diverse group in each specific agro-ecosystem. The present study which was carried out mainly in cereals, alfalfa and sugar beet in an agro-ecosystem of fields often surrounded by sparse hedgerows of fruit and non-fruit trees added 10 new records to the spider fauna of Razavi Khorasan province, of which, three are new for the fauna of Iran. The results presented here are part of a biodiversity survey on arthropods associated with important agricultural crops in north-eastern Iran. Undoubtedly, with more intensive research in different habitats including the non-agricultural ones, more species of spiders would be discovered that are either new to science, or new to the fauna of Iran.

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